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Effect of Phenothiazine on Color of Cow's Milk

Frothing, Surface Tensions, and Viscosities of Paunch Contents Associated with Change of Roughage

Disinfectant Poisoning in Chicks

Practical Small Animal Diagnostic Roentgenography

New Approach to Control of Nonspecific Diarrhea in Dogs

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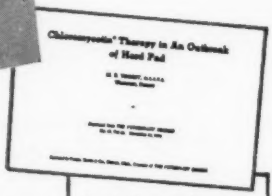
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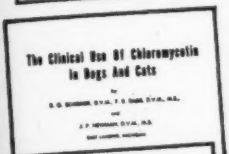
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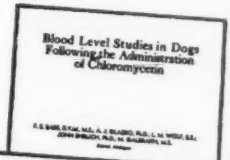
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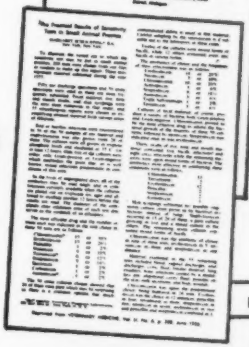

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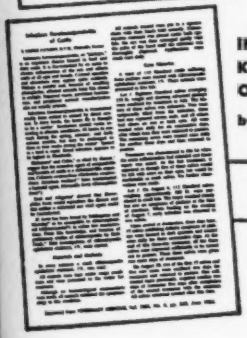
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Kinsley, A. T.: J.A.V.M.A. New Series 1:49 (Oct.) 1915.
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Aitken, W. A.: Animal Diseases, U.S.D.A. Yearbook of Agriculture, 1956, p. 255.
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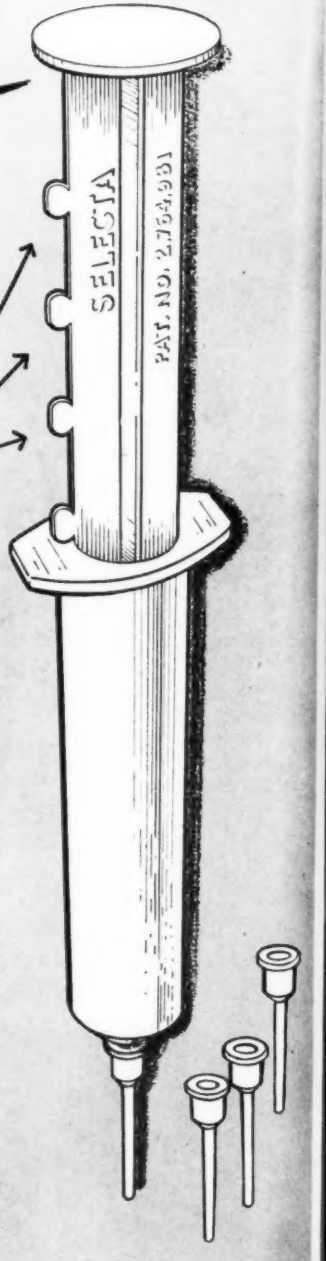

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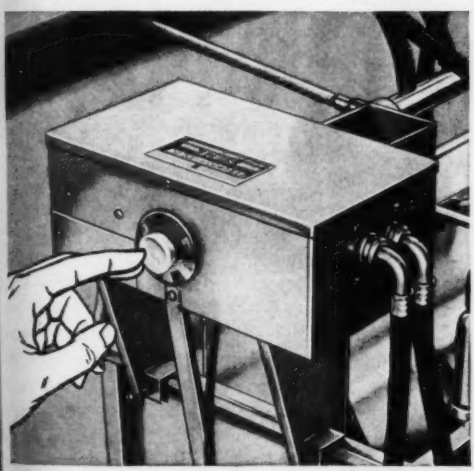

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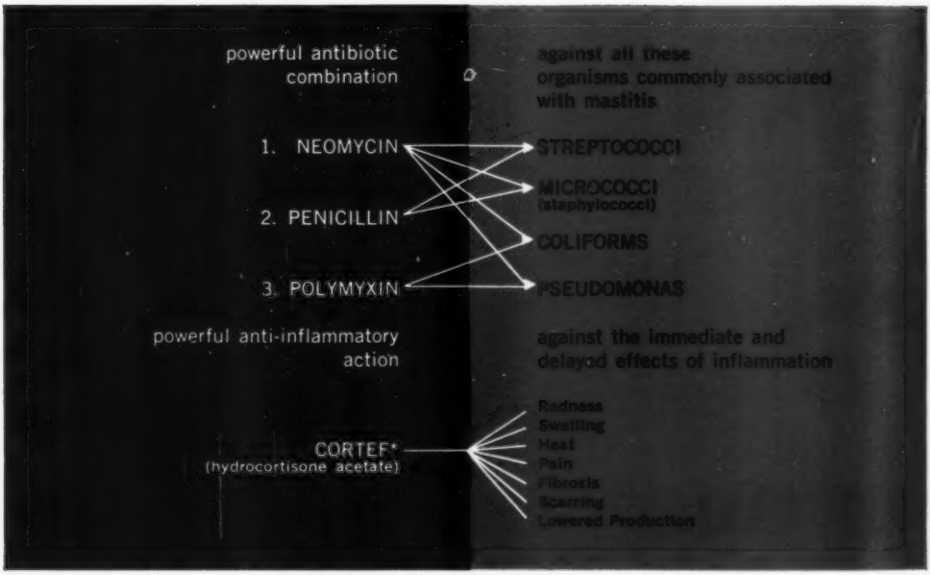

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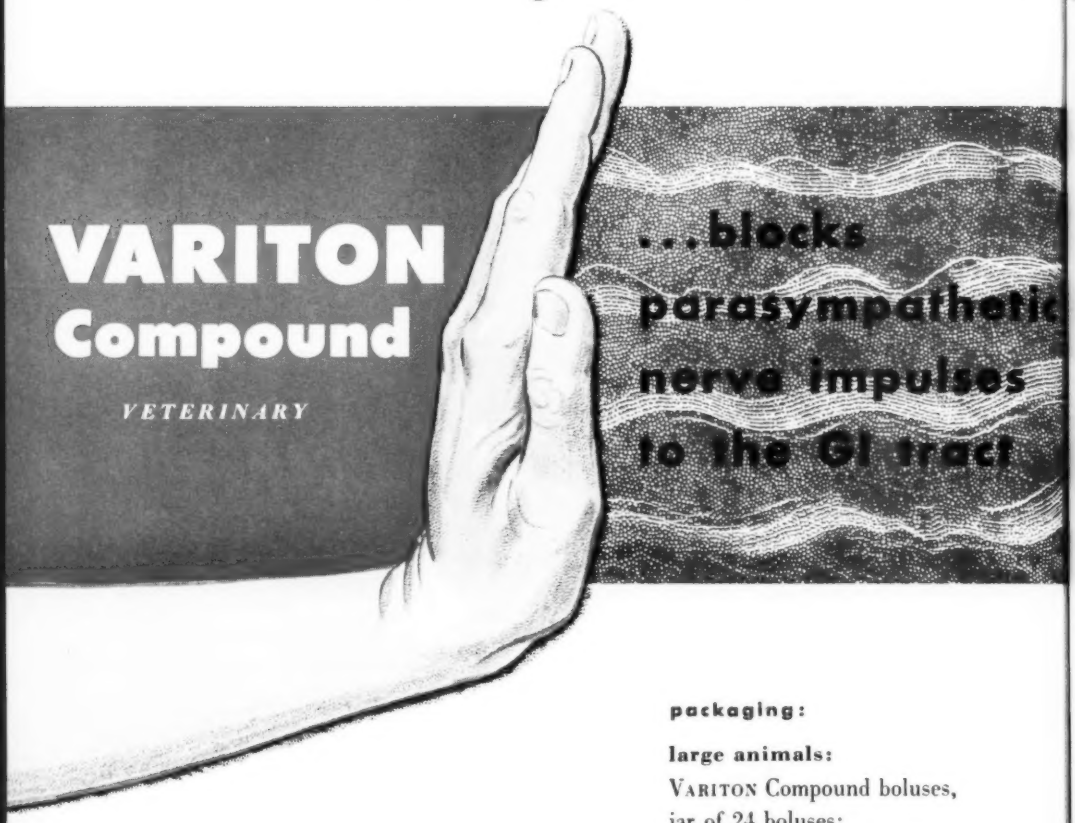

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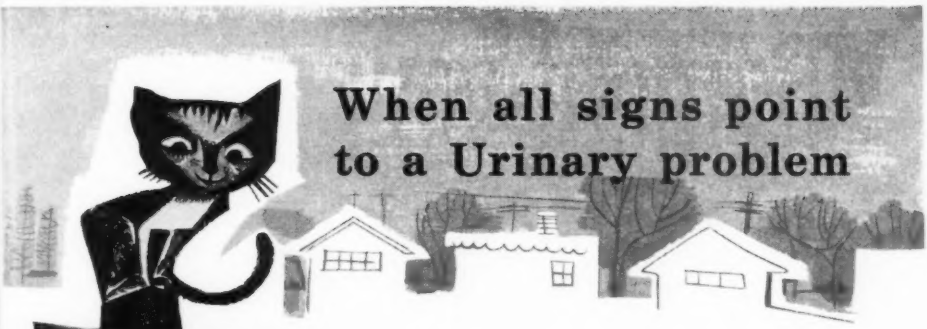

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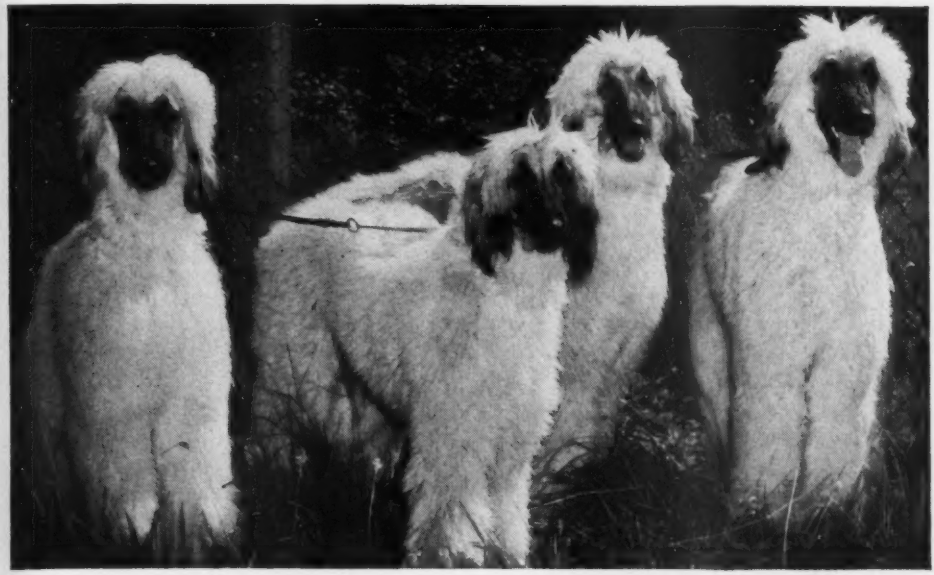

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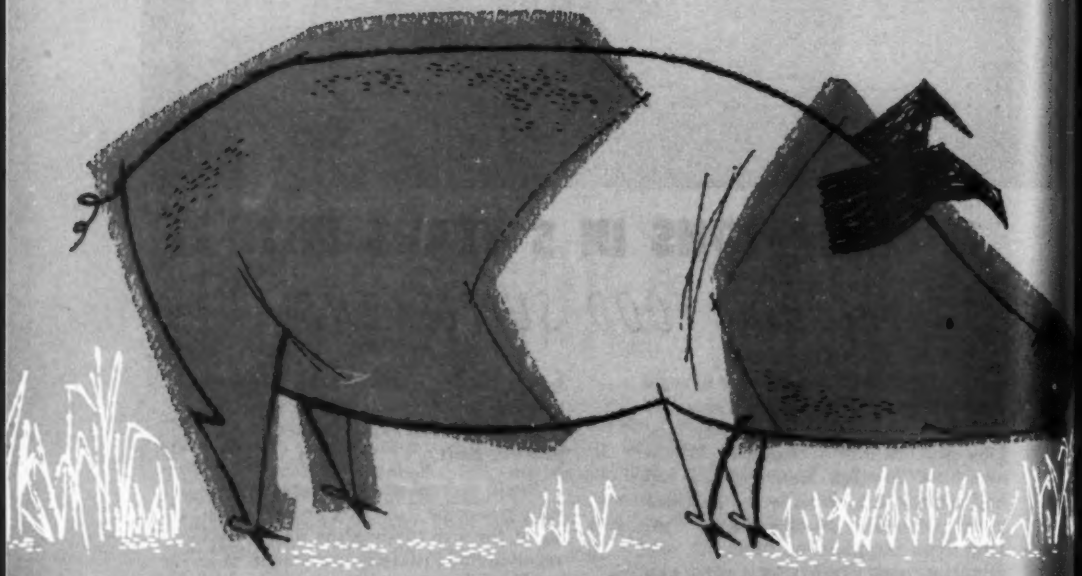

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Report of the 60th Annual Meeting U. S. Livestock Sanitary Association Chicago, Illinois

FOR many years the U. S. Livestock Sanitary Association held its annual meetings at Chicago, scheduling the event during the International Livestock Exposition. Beginning in 1909 and including all subsequent dates through 1947 meetings were held in Chicago. The Denver meeting in 1948, though not so well attended was an experiment in changing meeting locations and dates that worked well and that has been followed since. This year's meeting followed an old plan but does not mean a reversion to the former idea that the most satisfactory arrangements for meeting is to return to the same meeting place year after year.

The meeting for 1957 has been scheduled for St. Louis, Mo. Dates and headquarters hotel to be announced later.

Following precedence of recent years there appears in this issue of VETERINARY MEDICINE abstracts, notes, briefs, or adumbrations of certain of the formal discussions and committee reports, some of which were reported only in outline or read by title. An attempt has of course been made to accurately reflect the speaker's intent but it should be understood that opinions expressed herein are the reporters interpretations of statements unless the statement appears as a direct quotation. Charts and graphs and some of the illustrations employed in this report were furnished through the courtesy and cooperation of the Association through the office of its secretary, Dr. R. A. Hendershott.

The President's Address

President A. L. Brueckner, state veterinarian of Maryland voiced concern relating to the relationships of practicing veterinarians and their clients under the fee payment system now in use in the cooperative brucellosis eradication program. "No one can deny," he stated, "that progress has been rapid beyond the dreams of all concerned and that this would not have been possible on a voluntary testing basis or on a compulsory basis where the owner paid the bill."

Dr. C. H. Good, Wyoming State Veterinarian, Cheyenne, President of the U. S. Livestock Sanitary Association.

In spite of the record and the responsibility of government in underwriting programs directly concerned with the public health, a check must be placed on free veterinary service. Responsibility of disease-free herds is the owner's and not the government. The inherent dangers in the practice is that owners may request more and more relief of cost of disease control in their herds and flocks. If the practice as it now applies to bovine brucellosis eradication gets out of hand, a situation conceivably could result in private practitioners functioning as federal government employees primarily. If such a trend gained momentum, some sacrifice of professional service to

clients likely would result. This is not to say that every effort, including mass attack by way of a prepaid program should not be followed in the event of an emergency. A temperate middle ground must be sought, considering responsibility of herd owners to prove the health-safety of his animals on the one hand and the lifting from both herd owners and tax payer financial responsibility by freeing the entire livestock industry of the causative agents of disease, especially those having public health significance.

Doctor Brueckner referred to the increased number and percentage of tuberculosis reaction for the fiscal year just reported to the previous 12-month period. He reminded his listeners of the importance of eradication of this disease in poultry, swine, and other mammalian species that might be reservoirs of infection for cattle.

The remarkable rate of adding Modified-Certified Brucellosis free herds, counties, and states was cited as a result of brilliant planning and hard work. Continued liberalization of restrictions on vaccinated animals as further information is revealed through research should be considered to promote and encourage eradication efforts. Doctor Brueckner pointed out that though not desirable keeping reactions on farms does not pose as vital a problem as formerly since a greater proportion of herd replacement are calf-vaccinated.

Swine brucellosis control still lags behind the accelerated programs for cattle. It must be kept in mind that a significant infection rate among swine might prove a greater impediment to the cattle program that once was considered likely. Some swine producers, according to Doctor Brueckner, do not understand why the same principles of control and eradication set up for cattle do not apply to swine.

Other possible infectious sources of Brucella infection including that among goats though not a major national problem has inherent danger in slowing up accomplishment hoped for the cattle program.

Referring to disease research, President Brueckner pointed out the advantage of cooperative efforts of the Agricultural Research Service and state organizations for the development of technical staffs and facilities for work on problems of important local concern; either state or regional. Stimulation through grants-in-aid to such state organizations should be continued. Development of federal organizations such as the Plum Island Laboratory and the new Diagnostic and Research Laboratory announced for location at Ames, Iowa

Dr. R. A. Hendershott, Trenton, New Jersey, Secretary-Treasurer of the U.S. Livestock Sanitary Association.

are notable. It is hoped that their great cost will not materially affect financial participation of the federal government in state organized research effort.

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Officers for the New Year

Nominations of the Committee appointed to select a slate of officers for 1956-1957 were voted unanimously. Dr. G. H. Good, Wyoming state veterinarian and executive officer of the Livestock Sanitary Board was selected as President. Dr. John G. Milligan, Alabama state veterinarian, Dr. H. V. Garrett, Iowa state veterinarian, and Mr. F. G. Buzzell, Augusta, Maine were selected as first, second and third vice presidents respectively. Dr. Ralph A. Hendershott, New Jersey director of the Division of Animal Industry, Trenton, was retained as secretary-treasurer to serve his 14th consecutive term in that capacity.

Resolutions

A number of resolutions were presented for adoption by the Executive Board. These included:

1. Expression of appreciation to those responsible for programming and various speakers, and to Dr. R. A. Hendershott, executive secretary, on whose shoulders fall much of the responsibility for proper and efficient functioning of the Association.

2. Mastitis. Requests that the U. S. Pure Food and Drug Agency demand that all products prepared and made available for the treatment of dairy cows suffering mastitis incorporate a dye substance which by its presence will eliminate the possibility of fluid milk containing the therapeutic agent. This to eliminate the problem now posed by antibiotic laden milk to cheese manufacturers and for reasons of public health in consideration of the possible antigenicity of minute amounts of antibiotic that may be contained in the fluid milk supply.

3. Mastitis Research. Urges augmentation of presently available funds for research on bovine mastitis, particularly on methods of prevention and control.

4. Leptospirosis. Ask that the United States Department of Agriculture coordinate and direct research on diagnosis, treatment, and control of leptospirosis so that grounds might be established for the development of uniform procedures to be formulated by states.

5. Hog Cholera Eradication. Requests the federal government to cooperate with state officials in developing plans for control and eradication of hog cholera.

6. Garbage Cooking. Urges perfection of regulations and strict enforcement where laws have been promulgated concerning garbage treatment before feeding swine.

7. Swine Brucellosis. Recommends a program to be developed then jointly supported by appropriation of state and federal funds to properly activate such program.

8. Meat Inspection. Calls attention to facts emphasized that 20% of meat in market channels is not inspected by the Meat Inspection Branch. Urges states to enact legislation providing an adequate inspection service for intrastate distribution of carcasses, parts, or products therefrom.

9. Poultry Inspection. Endorses and recommends that Congressional action be taken promptly on a poultry inspection bill that will place the responsibility for sanitary inspection of facilities and health inspection of carcasses in the Meat Inspection Branch. It had been previously noted that this might be accomplished most easily by amendment to the Meat Inspection Act of 1906 to include poultry.

10. Training Courses in Regulatory Service. Secretary of Agriculture is requested to take any measures as may be necessary to enable qualified personnel of the Department to respond to requests of colleges and universities for part time or special instruction of advanced veterinary students in regulatory procedures.

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The 1956 Annual Report

The full text of reports delivered during the three-day session of the nation's foremost livestock sanitary authorities can not be reproduced here. Nor are the abstracts, notes, and excerpts that form the context of these paragraphs to be considered an adequate condensation. However, the complexities that face professional leaders in the livestock sanitary field are pointed up here, and the conclusions reported are those expressed by speakers which provide a definitive frame of reference for the meeting, and can be calculated to give direction to future activity in the field of disease control and eradication. The ramifications of this national problem that found expression at the meeting are reported here only in outline; the full details must await the publication of the entire proceedings now scheduled for early 1957. Readers of VETERINARY MEDICINE are urged to become associate (not official) members of the U. S. Livestock Sanitary Association, which entitles them to a copy of the proceedings.

Inquiries should be directed to Dr. R. A. Hendershott, 33 Oak Lane, Trenton, New Jersey. Annual dues are $5.

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Thyroprotein for Dairy Cows

Recent experiments have revealed widely varied responses among individual dairy cows to the addition of the thyroprotein to rations. The tests demonstrate the seemingly inevitable drop-off in milk output once the product is eliminated. Total milk production is not increased by use of thyroprotein when it is fed either for short periods or throughout the lactation. A possibility does exist of the practical use of this drug during periods of normally low production when milk prices are high.—*Agri. Res.*, Nov. '56.

TUBERCULOSIS ERADICATION

Notes from paper presented by A. F. Ranney, D.V.M., M.S., Chief, Tuberculosis Eradication Section, Animal Disease Eradication Branch, A.R.S., USDA, Washington, D. C.

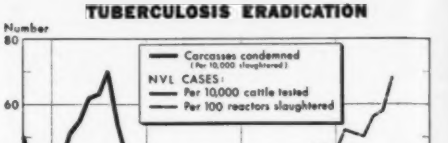
During the fiscal year 1956 (July 1, 1955 — June 30, 1956), 9,220,000 cattle were tuberculin tested of which 14,363 reacted positive. This incidence rate (0.15%) of animals tested is increased over figure for previous years (1952, 53, 54 — 0.11%; 1955 — 0.12%). This was expected and further increases are likely if present methods of tracing infected herds and spot testing when suspicious, continues. Improved methods of tracing herds of origin that have revealed reactors or shown lesions on slaughter suggests that the increase in percentage of reactors is due not so much to a greater incidence of disease as to greater efficiency in locating infected animals.

In spite of some apathy, especially regarding no lesion reactors, Doctor Ranney emphasized that the aim of the presently organized federal-state cooperative project was complete eradication of bovine tuberculosis. Regarding the no lesion reactor the speaker referred to statement by Dr. Howard Johnson, in which it was pointed out that early lesions of tuberculosis are difficult to detect even on microscopic examination. The fact that no gross lesions are observed on slaughter of a tuberculin positive is not proof that the disease was not present. The concern is the possible tuberculous animal which fails to react to test; not the animals in which lesions are not demonstrated.

Concern was also expressed in relation to attitude of some that many reactors in supposedly non-tuberculous herds are not removed when they are found. These have considered such animals "deviators" and are ignored. The chances of a deviator being tuberculous is probably as great as that of a reactor being tuberculous. Actually, results indicate high incidence of tuberculosis among so-called "deviators."

Decline of Carcass Condemnation

The accompanying figure graphically illustrates the decline in carcass condemnation for tuberculosis since 1927. It also illustrates how the ratio of no visible lesion cases to the number of cattle tested remained rather steady until 1940 when the country approached a modified accredited status. Ratio of no visible lesion cases to reactors slaughtered has increased steadily as the incidence of infection has been reduced.



Project Progress

Formerly progress was measured by the number of counties reaching modified accredited status. Now less spectacular results get less attention. However, attempts to wipe out the last disease carrier are sometimes dramatically spectacular and of no less importance considering the prodigious livestock movement. Eradication of disease in one place probably protects many others that might receive replacement animals from it.

Greater effort and increased cost per reactor is to be expected as infection is diluted. During the last half of the fiscal year reported, approximately 75% of cattle tested was in the course of area retests. From this group was selected 62% of the total reactors. In quarantined herds almost 25% of all reactors were identified in only 3.3% of animals tested during the same period. One reactor was found in quarantined herds for every 91 animals tested as compared with one reactor for every 774 tests to reaccredit areas.

Though improved during recent years identification of animals going to slaughter needs continued improvement. To illustrate the point Doctor Ranney pointed out that prompt identification as to source was possible on 100% of Brucella tagged animals showing tuberculous lesions at slaughter.

Volume of testing must be increased if even a *status quo* is maintained. Statistical calculations indicate that at least approximately 10% of all cattle (8,000,000 to 9,000,000) need to be tested in order to detect reactors as fast as they may become infected. Actually the ratio of cattle tested to cattle population is not as favorable today as it was ten years ago.

Complete eradication of bovine tuberculosis still requires all the action and ingenuity possible to muster. Any relaxation of vigilance can mean disaster so long as a single infected spreader exists.

FIFTY YEARS OF FEDERAL MEAT INSPECTION

Notes of address by C. D. Van Houweling, D.V.M., Director, Livestock Regulatory Programs, A.R.S., USDA, Washington, D. C.

This presentation included a group of slides illustrating growth through the years of the federal meat inspection service, and a motion picture of meat inspection in action. The latter was prepared for professional groups, including veterinary and associated professional people interested in public health and hygiene. It also is considered as a good public relations effort for a wide diversity of civic bodies. It commemorates the golden anniversary of the service that has, perhaps, contributed more than any other function veterinarians perform to service of mankind.

President Theodore Roosevelt signed the Meat Inspection Act in 1906 which was passed by a congress under various pressures. Congressional approval was given in the interest of protecting the American export trade in meat and meat food products, and secondly because of public indignation following publication of the muckraking novel, The Jungle, which focused public attention on unsanitary conditions in meat packing plants. Neither of these influences survived the white light of critical scrutiny. European rejections were at least in part invoked as a protection device for the continent's own livestock trade. Nevertheless, the inspection service inaugurated served to break down restrictions and create confidence abroad in American exports. The influential novel by Upton Sinclair was later shown to have, to an extent, exaggerated isolated conditions, and magnified them through the fictional device of representing all abuses as commonplace.

The law has since proved to have not only served for consumer protection but has stimulated a profitable livestock industry which has enjoyed consumer confidence in its produce. Americans now consume an average of 162 lb. of red meat per person annually, an amount exceeded by only one other nation of the world.

Development of the federal paid service has grown to inspection of 100,000,000 carcasses annually in 1,200 plants in nearly 500 cities and towns. Cost has been insignificant considering its value as assurance against transmission of zoonoses and that unsavory conditions and practices are controlled. This cost averages 9c per person or approximately 15c per animal carcass on the 80% of the total meat food offered for sale.

50th Anniversary
FEDERAL MEAT INSPECTION
Every minute of every working day 820 meat animals are Federally inspected.
Veterinarians and trained Meat Inspectors are dedicated to assuring the production of clean, sound, wholesome meat free from adulteration and truthfully labeled.

Veterinarians charged with the operation of the service have earned the tribute they have received for contributions not only as they apply directly to public health but to animal disease control as well. The success of effort along these lines has played a major role in disease eradication which has been reflected in a lower percentage of animals found unfit for food. Today, only about 0.25% of those animals submitted for inspection are found unfit for food.

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COMMITTEE ON RABIES

Report by V. D. Chadwick, D.V.M., State Veterinarian of Mississippi, Jackson, Miss., chairman.

The trend in incidence of rabies in dogs is downward; in wildlife, upward.

Survey of reported cases for 1955 against those reported for 1954 represents 50% reduction in the number of dog cases this past year. The disease in foxes and skunks has headlined rabies statistical information in all recent reports.

According to figures released by the USDA, 5,844 cases appeared in 1955 of which 2,657 were in dogs, 343 in cats, 956 in livestock, 1,223 in foxes, 586 in skunks, and 48 in other species of wildlife. This was a drop of 1,438 total cases from the incidence in 1954. One of the greatest reductions in incidence was posted by Texas. The successful control program in Houston-Harris County was largely responsible for this drop. This area contributed more than one-half of the state's total in 1954. States reporting significant rises in incidence during the past year were California and Pennsylvania. Wildlife (skunks in California and foxes in southeastern counties of Pennsylvania) largely accounted for increased number of cases reported. Five human deaths were reported during 1955 and the same number have been reported thus far for the first six months of 1956. It is of epizootiological interest to note that 20% of the human cases occurring in the United States during the past four years have been attributed to exposure to rabid wildlife.

Approximately 170 isolations of rabies virus have been made from several species of bats since 1953.

Recommendations of the Committee this year included urging an adequate nation-wide control and eradication program. This is to correlate state control agencies, public health, and wildlife conservationists. Such a program is long overdue.

DIFFERENTIATION OF VESICULAR DISEASES BY SEROLOGICAL PROCEDURES

Abstract of paper presented by C. B. Rice, M.A., Ph. D., Animal Pathology Division, Canada Department of Agriculture, Hull, Quebec.

Three major vesicular diseases affecting domestic livestock throughout the world are foot-and-mouth disease, vesicular stomatitis, and vesicular exanthema. Differentiation can not be made on symptoms alone so that other procedures attain prominence for definitive diagnosis. Inoculation of susceptible and non-susceptible animals was formerly the most important and universally applied diagnostic method. It now serves only to complement laboratory methods developed which are extremely sensitive.

Vesicular exanthema. Note vesicules (circled) near the posterior cleft margin. Lesions on the coronary band are covered with a blackened crust. Vesiculation, rupture, and scab formation progress in rapid succession.

Many technical problems have arisen relating to differentiation by laboratory means particularly as they apply to the complement-fixation test. Well-trained personnel, maintenance of standard antisera for the six or seven types of foot-and-mouth disease virus, two types of vesicular stomatitis virus, and five or more of the virus of vesicular exanthema, in addition to the usual reagent required, are consideration from the laboratory standpoint. Perhaps all this is dependent on the first es-

sential *i.e.*, suitable material to be tested. Well-trained alert field men with a thorough knowledge of the symptomology of these diseases and the best procedures of collecting infected material are essential to accuracy. Vesicular material for virus detection should be collected from suspect aniamls when the viral content may be expected to be at its maximum, usually at the peak of fever or slightly later when vesicles are well developed and before exfoliation has occurred.

During advanced and late stages of vesicular disease diagnosis depends on antibody demonstration. Detection requires that corresponding standard viral antigen are at hand. All these requirements and technical procedures limit performance of the test to specially equipped laboratories where such antigens or infected tissue from which they are prepared can be maintained without hazard to the livestock population.

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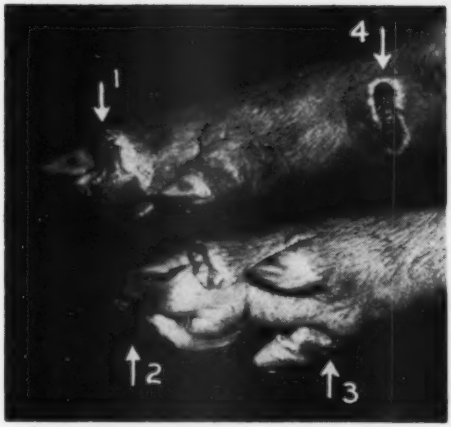
ENZOOTIC VESICULAR STOMATITIS

Abstract of paper presented by R. P. Hanson, Ph.D. and L. Karstad, D.V.M., University of Wisconsin, Madison.

A study of the epizootology of vesicular stomatitis has been carried out by the cooperative efforts of a group of scientists of the University of Wisconsin and several interested state and federal groups, including the Georgia State Board of Health, Fish and Wildlife Service, Research and Parasite Branch, and the Animal Disease Eradication Branch, A.R.S., State and Federal Veterinarian of Georgia, the United States Public Health Service, the U. S. Army Veterinary Corps, and others. The effort of interest to so large a group is to gather evidence of epizootology of this vesicular disease, reservoir of infection, possible vectors,

Vesicular stomatitis in a cow. Recently ruptured vesicle at site of inoculation on the tongue.



Vesicular exanthema. Appearance of feet in advanced case (approximately ten days). Extensive area of granulation (1) on coronary band, most of the heel and sole. Slough of sole (2), and around dewclaw (3). Decubital sore (4) common in many affected animals.

et cetera, in consideration of the known instability of the viral infectious agent. No satisfactory explanation of its reappearance in various parts of the country so far has been advanced.

The disease is observed in the southern part of the United States annually, usually during mid-summer with a six month disease free period, and in the northern and western areas less frequently, or as occasional outbreaks. Manifestations of the disease also differ regionally.

Outbreaks involving rather large numbers of cattle and horses have been reported from Wisconsin in 1926, 1937, and 1949. Lesser numbers of premises have been reported to suffer limited outbreaks since.

In the Atlantic Coastal Plains region the disease has appeared annually, revealing insidious infection diagnoses in swine as well as cattle. Inquiry of local practitioners in the Altamata River drainage area indicated the annual recurring incidence of the disease. Determination of antibody titer as a gauge to exposure here revealed that approximately 50% of domestic animals on farms carry neutralizing antibody titers. Swine affected early in the season usually had access to well shaded, wet, marshy lands. Animals maintained in dry pastures usually developed the disease later, suggesting the possibility of reservoir host or hosts among wild life of the region. Inquiry into this point posed the problem of trapping, bleeding and testing for antibodies as repre-

sentative group of animal as possible. Results reported revealed the 48% of some 59 raccoons passed high blood neutralizing antibody titer, as did 60% of 25 deer, 83% of 34 feral swine (wild hogs), and 33% of eight bobcats.

Deer were found to be highly susceptible to infection which developed to only moderate severity before complete and prompt recovery. Manifestations of disease was acute and short-termed and followed by a rapid development of high-level virus neutralizer titers. For these reasons it was concluded that deer probably play little part in building up a virus pool for dissemination to domestic stock. However, they may contribute largely to supply of virus to other hosts. Vesicular stomatitis produces an insufficient infection in raccoons though antibody response is great. Like deer, the raccoon is probably not the important long-term virus carrier or reservoir.

Raccoons as well as swine were experimentally infected by ingestion of vesicular stomatitis virus. Whether or not oral abrasion was necessary for infection was not determined. Possibly the natural route of infection and transmission is *via* the digestive tract in swine and in cattle and horses by way of some vector for transmission from larger verterbrates.

Adapted from film—Vesicular Diseases in Animals

Vesicular stomatis. Note blanching in the region of the coronary band where a vesicle had formed. The slit-like opening at the upper margin of the blanched area indicates location of a vesicle just after rupture. All blanched skin could have been removed easily which would have exposed an angry, red surface.

These facts suggest that reservoir host such as swine or raccoons exist among animals and insects constituting a portion of the diet of raccoons and feral swine that infest wet wooded or swamp lands. Study of large numbers of various species failed to give positive identification of the virus of vesicular stomatitis yet several virus-like agents were recovered and these are under study.

Speculatively, virus of enzootic vesicular stomatitis is carried over winter months in a cold-blooded animal which is ingested by raccoons or pigs who develop infection. Vectors transmit virus from lesions on these animals to cattle, horses, or deer, where it is perpetuated during the summer.

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DIFFERENTIAL TEST FOR NONSPECIFIC BRUCELLA AGGLUTINATION REACTIONS IN BOVINE SERUM

Note of paper presented by Frank C. Stiles Jr., D.V.M., Animal Disease, Eradication Branch, A.R.S., USDA, Washington, D.C.; Thomas G. White, M. S., Division of Veterinary Bacteriology and Public Health, School of Veterinary Medicine, University of Minnesota, St. Paul; Fred C. Driver, D.V.M., A.R.S., USDA; and Martin H. Roepke, Ph.D., University of Minnesota, St. Paul.

In some portions of Minnesota and other regions a problem as been posed by the low titer seroagglutination reactions in otherwise negative herds. The problem dairy herd having a single reaction has been emphasized since the semiannual milk and cream ring test has been employed to disclose infected herds.

Objective of research effort was to modify or improve specificity of Brucella antigens to aid in proper interpretation of the seroagglutination test. Extensive field studies were reported indicating that a high percentage of bovine serums of low titer from suspect herds contain nonspecific agglutinins for Brucella. Most of these are inhibited if the acidity or pH of the serum-antigen mixture of the 1:25 dilution of the plate test is adjusted to pH 4.0 to 3.50 by additions of suitable amounts of concentrated acetic or lactic acid to the official plate test antigen. The accuracy of the acidified plate antigen (APA) test may be acceptable if employed only on reactor serum from herds containing one reactor or no other evidence of infection or history of recent infection. It is not designed to be used on serum from herds with evidence of infection but may be of benefit as an aid in obtaining additional diagnostic information on selected types of serum.

SHEEP AND CATTLE SCABIES ERADICATION

Notes of address by J. L. Hourrigan, D.V.M., Chief, Special Diseases Eradication Section, Animal Disease Eradication Branch, A.R.S., USDA, Washington, D. C.

The history of scabies and experiences with the parasitic disease in both sheep and cattle in this country for over 50 years, is a fascinating chapter in the story of disease control.

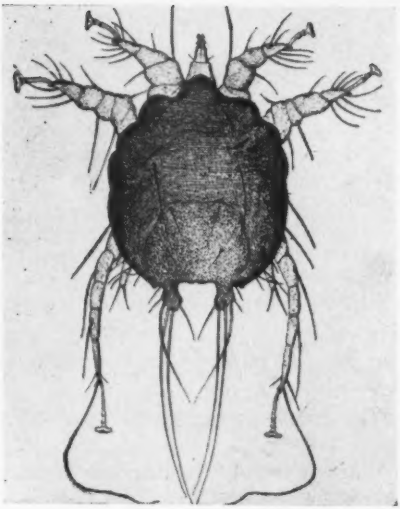
Scabies is as old as recorded history. The causative mite was revealed nearly 300 years ago; its discovery a medical milestone establishing for the first time microbic origin of infectious disease, and dealing a devastating blow to the doctrine of humoralism as a pathologic concept.

The National Wool Growers Association is the nation's oldest livestock organization and was established in 1865 primarily for purposes of perpetuation of high tariffs on wool. Almost 50 years ago (1907) this organization threw the full force of its effort against a disease agent, scabies, and obtained Congressional appropriations and federal approval of a control program. It took over 20 years of dipping sheep before a point of satisfactory control was obtained; a few years later essential eradication was effected on the range lands west of the Missouri river.

Scabby sheep and goats did exist in some eastern and southern regions, however, and these proved reservoirs of infection when economic conditions caused unusual movement of breeding stock. Reinfection has occurred time and again and quarantine and dipping have had to be resorted to almost continuously.

Cattle Scabies

Psoroptic cattle scabies became such a serious problem at the turn of the century that a federal declaration was placed into effect involving western range country in 1903. Since



Psoroptes equi var. *ovis* (male, dorsal view greatly enlarged) the common scabies mite of sheep. The female lays but 15 to 24 eggs in her lifetime.

1948 this country has remained relatively free of psoroptic cattle scabies, though diagnosed in no less than nine states in 1954 and in five during the past fiscal year.

Incidence of chorioptic scabies in cattle has increased during recent years. Diagnosis has been confirmed at a number of expositions and other points of livestock concentrations.

Sarcoptic cattle scabies has been found on both farm and range cattle.

Sheep Scabies (Psoroptic)

Official reports appear to indicate increased incidence of scabies in sheep. Figures (see page 10) reveal upward trend of infection:

Ewe showing advanced lesions of psoroptic mange with loss of wool and presence of scab.

Fiscal Year	No. States	No. Counties	No. Flocks
1954	21	183	391
1955	24	219	442
1956	25	267	607

In addition to the above some 110 consignments of sheep to public stockyards were quarantined for scab.

A review of methods of spread by control officials, growers, and others concerned resulted in the following statement of reasons that in themselves suggests corrective measures:

1. Through purchases from public stockyards, sales and auction rings, and other concentration points.

2. Through extensive movement by farmers, dealers, truckers.

3. Through lax dipping practices especially during winter months.

4. Through purchase of infected rams.

5. Through the difficulty of detection of disease in early stages.

6. By diversion of shipments in violation of sanitary requirements.

7. Because of shortage of veterinarians qualified by training and experience to make field diagnoses.

Following the conference referred to above, the A.R.S. developed a program which gained approval and cooperation of state officials on whom rests the essential burden of eradication. Federal quarantine will be applied when needed. Systematic inspection and more dipping must be done. Continuation of outbreaks and spreading of infection will mean simply carelessness or human error; modern ascaricides are dependable agents.

TWELVE YEARS SUCCESSFUL VACCINATION OF FARM HERDS WITH CRYSTAL VIOLET-GLYCEROL HOG CHOLERA VACCINE

Abstract of paper by C. G. Cole, D.V.M., Ames, Iowa; J. P. Torrey, B. S., D.V.M., M.S., Animal Disease and Parasite Research Branch, A.R.S., USDA, Ames, Iowa; and M. R. Zinober, D.V.M., Animal Disease and Parasite Research Branch, A.R.S., USDA, Live Oak, Fla.

Many different chemicals and methods for inactivation have been tried in an effort to produce a satisfactory prophylactic vaccine for hog cholera. The efforts predate the discovery of the simultaneous vaccination procedure. Blood and various selected tissues have gone into production of experimental vaccine, one of the most promising resulting from intensive search was crystal violet-glycerol (CVG) vaccine developed by Dr. Frank Tilley in 1943.

Vaccination of farm herds was begun in 1943 and results of 12 years experience with it during this extended period are reported.

Material

Preparation of vaccine included bleeding out (seventh day) artificially infected pigs purchased from farms free of cholera. Defibrinated blood free of bacterial contaminates was mixed with a solution of glycerine and crystal violet (400 parts glycerine to one of crystal violet) in proportion of one part of glycerine-crystal violet mixture to four parts of blood. Incubation of the final product completed the manufacturing process.

Testing for potency involved injecting pigs with 1, 2.5, 5, and 10 cc. of vaccine. After 21 days all were challenged with virulent virus. Pigs injected with 1 cc. may show reaction or die; others must live.

Conduct of Trials

Farms were selected within a ten-mile radius of the Ames experiment station most of which

Improvised dipping equipment suffices for small farm flocks. Either a 55-gallon steel drum or watering trough serve well.

limited swine growing to 100 head or less. Four of these have been kept on the program for the entire 12-year period. When owners agreed to provisions of the contract for free vaccination, they were required to deliver hogs for immunity test at the prevailing market price.

General plan followed was as soon as pigs had been weaned for one or two weeks they were injected subcutaneously with 5 cc. vaccine for those under 75 lb. and 10 cc. for those over that weight.

When marketable size and weights had been attained pigs selected for immunity test were injected with 2 cc. of virulent hog cholera virus subcutaneously and daily observations made to determine any reaction and degree by a point system that placed these animals in one of four groups: Normal, slight reaction, severe reaction, and dead.

Results

Over 20,000 head of swine have been vaccinated under this program. Representation immunity checks were not made on all herds but a total of 523 head from 42 farms representing 12,167 head vaccinated were challenged.

Variations occurred in herds and for different years. Compilation of final results indicated that 92.8% survived a challenging dose of virus. Considering the severity of challenge and the large numbers involved in the test it may be concluded that this vaccination method has noteworthy merit as an immunizing agent. Slight or no reactions were observed in 77.5% and 7.2% died following challenge.

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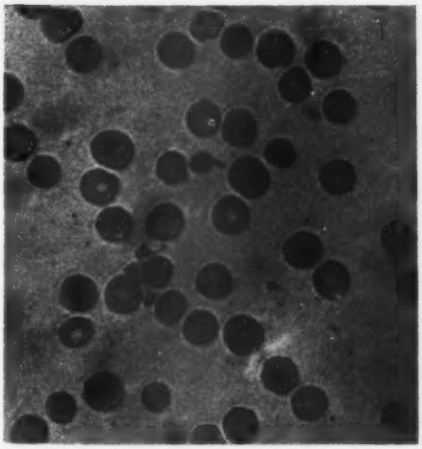
INHIBITION OF ANAPLASMA MARGINALE INFECTION IN CATTLE WITH OXYTETRACYCLINE HYDROCHLORIDE

Notes from address by John F. Christensen, Ph.D., D.V.M., and J. Boyd Harrold, School of Veterinary Medicine, University of California, Davis.

Research reports have appeared from time to time relating to the efficacy of chemotherapeutic agents for the treatment of cattle infected with anaplasmosis and carriers of this disease. Results has been based on comparion of survival rates in treated and untreated animals, usually without regard to the possible influences on susceptibility of such factors as age, general condition, environment, or variations of virulence. There appears to be a need for more accurate and objective criteria for judging value of treatment agents. The speaker referred to the work of Lotze in which was suggested that the parasiticidal action of a drug could be evaluated on its influence on the pattern of rise in infection judged by Anaplasma body increase.



Analplamia marginale. As high as 50% of the red blood cells may be infected during febrile stage of the disease.

Reported in detail was research conducted at the California veterinary school to test the efficacy of oxytetracycline hydrochloride (terramycin)® against *A. marginale* infection in a group of Hereford heifers of uniform age, origin, and condition.

Conclusions derived from these experiments strengthen the knowledge of the inhibitory effect of certain antibiotics on the increase of Anaplasma bodies. The practical implications of these and similar observation are not entirely clear, according to the investigators, but the suggestion is made that there should be further exploration of the idea of using antibiotic-controlled infections for the production of immunity in valuable susceptible animals that are to be added to cattle herds in areas where incidence of carrier infection is high.

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Food factors probably contribute more than disease agents to losses among newborn calves. Essential food factors for health (vitamins, minerals, amino acids, et cetera) are not well defined for the first 30 days of the calf's life. More information must certainly be revealed before improved livibility figures can be realized.

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Almost four times as much turkey was consumed in 1956 as in 1931.—*Poultry Digest.*

®Chas. Pfizer & Co., Brooklyn, N. Y.

A PRACTICAL EVALUATION OF LIVE IMMUNIZING AGENTS

Abstract of paper presented by J. M. Hedl, D.V.M., Washington, D. C.

Proved immunizing agents have created problems for state officials in disease control work. The Biological Products Licensing Board of the Agricultural Research Service is aware of these problems in licensing products for distribution to veterinarians.

Considerable confusion in reference to classification of these agents has occurred as the number and complexity of agents has been added to those available commercially. For example, classification of virus vaccines include:

(1) Live viruses. Prepared from live viral agents usually isolated from an infected host. These agents are virulent and capable of reproducing disease in susceptible animals. Examples — Hog cholera virus, fowl pox vaccine, and others.

(2) Attenuated virus vaccine. A live virus vaccine may be avirulent, although showing some characteristics of the typical virus, is atypical in disease-producing potential. Usually virus is naturally attenuated and at worst produces only mild disease manifestations. Examples — Newcastle disease vaccine (B_1 strain), Brucella abortus vaccine (strain 19), et cetera.

(3) Modified live virus vaccine. Prepared from viral agents whose disease producing properties have been altered, usually by repeated passage through unnatural hosts, but is still capable of stimulating antigenic response. Examples — Hog cholera vaccine, modified-live virus (rabbit and porcine origin), rabies vaccine, modified-live virus (chick-embryo origin), and others.

(4) Inactivated virus vaccine. All infectious properties are rendered innocuous usually by chemical treatment. Examples — Hog cholera vaccine (blood or tissue killed virus), blackleg bacterin, et cetera.

A shift in production and use of veterinary biologicals from inactivated agents to live and modified-live vaccines has made necessary re-examination of methods and use of these products. They may be considered as refined principally because of their greater potency and specificity. These agents will usually stimulate higher immune level, more rapidly, which persists longer than that induced by inactivated agents. They do cause reaction manifested as leukopenia, and often mild and transient febrile response especially in animals having extreme sensitivity. In contrast inactivated products though safe require from two to three weeks to stimulate immune response.

Evaluation of Products

Evaluation of vaccine types is contigent not only on the potency and safety of the product but characteristics of the disease in question must be considered. Hog cholera virus and antiserum will control this disease but its use has the drawback that disease is continuously perpetuated. There is no hope for eradication as long as virulent virus is employed as an immunizing agent. Live-modified vaccines stimulate immunity promptly (seven days) and when administered with serum protection is afforded immediately on vaccination. At least seven states have outlawed hog cholera virus to prevent disease spread through its use.

Licensing

Two types of licenses issued to manufacturers authorize interstate shipment of products. The "regular" and "special" designation is administrative terminology under the Virus-Serum-Toxin Law. A special license is issued on data submitted satisfactory to licensing officials in instances where additional field experience is deemed desirable. It is not to be considered a stigma on the product. After field data satisfactory to officials concerned is available, a regular license is issued. This was the sequence of events relating to live-modified virus hog cholera vaccine.

This is not to deny that all virulent virus vaccine ought to be condemned. Under certain conditions relating to specified disease they fit into control programs. An example is use in those areas where the presence of a highly contagious disease would cause severe losses if vaccination is not carried out promptly.

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Orally Induced Immunity to Poliomyelitis

Induced immunity to poliomyelitis by the oral administration of tablets containing attenuated but living virus is reported by Lederle Laboratory scientist Harold R. Cox and Hiliary Koprowski, according to progress report.

A total of 600 persons have been shown to have developed "full immunity" against poliomyelitis after taking three doses, one for each of the known strains of poliomyelitis virus.

Report Of Committees

LAW AND REGULATIONS

Report by R. L. West, D.V.M., St. Paul, Minn.

For many years, regulations governing interstate movement of livestock based on health status have been promulgated by an agency of the federal government. These pertain to the testing of cattle for tuberculosis, dipping of sheep and cattle before interstate shipment to prevent the spread of scabies, and the vaccination of swine to be moved from public stockyards. State authorities from time to time have issued regulations and passed legislation having more stringent requirements than those contained in federal orders on the same matter.

Effort has been made toward uniformity of state regulations covering certain disease but progress along these lines has been slow. Reason for no action are many and varied; certainly it is understood that circumstances differ in different states and most regulations have been written to implement specific legislative action so that changes require legislative approval.

During the past year, the Agricultural Research Service has issued federal regulations relating to the movement of cattle according to their brucellosis health status. This has evolved after trying effort and nine years of conferences and considerable conflict. The Committee endorses the principles of this federal regulation and urges cooperation of all state regulatory officials in its enforcement.

It is believed that this new regulation (see summary table) will end confusion and conflict occasioned by variation of state laws. The new regulation governs all interstate shipments, taking priority over state requirements even though the latter be more stringent. A state can not keep out an animal which meets the federal requirement. It can, however, impose such quarantine and retesting procedures as

Brucellosis Regulations Regarding Interstate Shipment of Cattle

Class of cattle	Requirements to move into	
	Modified-certified brucellosis-free areas[1]	All other areas
1. Steers, spayed heifers, and calves under 8 months.	None.	None.
2. Cattle from brucellosis-free herds and areas.	Official certificate.	Official certificate.
3. Official vaccinates[2] under 30 months of age at time of shipment.	Official certificate and a permit from livestock sanitary official of state of destination.	Official certificate.
4. Official vaccinates[2] over 30 months of age at time of shipment.	Must be tested after 30 months of age and not react over incomplete at 1:100. Permit required. Animal must be placed under quarantine until negative or slaughtered.	Must be tested within 30 days of shipment and not react over incomplete at 1:100. Permit from livestock sanitary official of state of destination and an official certificate required.
5. Non-vaccinates over 8 months of age.	Negative blood test within 30 days of shipment. Permit required. Must be quarantined in state of destination until found negative after 30 days or be slaughtered. If cattle originate in herd under federal-state supervision and a herd blood test within past 90 days revealed no reactors, animals can move without permit and quarantine, providing each animal shipped was negative to another test 30 days from previous test within 30 days of shipment.	Negative blood test within 30 days of shipment plus official certificate.
6. Bulls and female cattle of beef type moved for feeding or grazing purposes only.	Can be moved under an official certificate and a permit from livestock sanitary official of state of destination if that state has laws, rules, or regulations providing for the segregation and quarantine of such cattle.	
7. Reactors.	Direct to slaughter at federally inspected plant or one specifically approved by U.S.D.A. with "B" brand on left jaw and metal reactor tag in left ear. Official certificate required.	

[1] The following states, counties, and municipalities are modified-certified brucellosis-free areas as of 12 July 1956:

The entire state of Maine.
The entire state of New Hampshire.
The entire state of North Carolina.
The entire state of Washington.
The entire state of Wisconsin.

Arizona: Hopi Indian Reservation, Navajo Indian Reservation, and Apache Indian Reservation.
Colorado: Southern Indian Ute Reservation.
Delaware: Kent and New Castle counties.
Idaho: Benewah, Bonner, Boundary, Clearwater, Kootenai, Latah, Lemhi, Lewis, and Shoshone counties.
Indiana: Allen, Brown, Crawford, Daviess, DuBois, Lake, LaPorte, Perry, Porter, Posey, Pulaski, Spencer, and Starke counties.
Maryland: Somerset, Wicomico, and Worcester counties.
Massachusetts: Dukes county.
Michigan: Alger, Chippewa, Crawford, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Lake, Luce, Marquette, Menominee, Ontonagon, and Schoolcraft counties.
Minnesota: All counties except Benton, Carver, Cass, Dakota, Hennepin, Isanti, Kanabec, Mille Lacs, Pennington, Pope, Scott, Stearns, Todd, and Washington.
Montana: Beaverhead, Broadwater, Chouteau, Carbon, Cascade, Daniels, Deer Lodge, Flathead, Lake, Lewis and Clark, Liberty, Lincoln, Mineral, Missoula, Sheridan, Silver Bow, Stillwater, Toole, and Valley counties.
Nebraska: Douglas, Fillmore, Jefferson, Johnson, Seward, and York counties.
Nevada: Mineral, Ormsby, and Storey counties.
New Jersey: Cape May and Atlantic counties.
New Mexico: Hidalgo county.
North Dakota: Adams, Benson, Bottineau, Bowman, Burke, Cavalier, Eddy, Grant, Griggs, Hettinger, McLean, Mercer, Morton, Mountrail, Nelson, Oliver, Pembina, Pierce, Ramsey, Renville, Rolette, Sheridan, Slope, Stark, Steele, Towner, Traill, Walsh, Ward, Wells, and Williams counties.
Oregon: Clatsop, Coos, Curry, Josephine, Marion, Morrow, Multnomah, Tillamook, Washington, and Yamhill counties.
Pennsylvania: Allegheny, Armstrong, Beaver, Bedford, Blair, Butler, Cambria, Cameron, Carbon, Centre, Clarion, Clearfield, Clinton, Columbia, Dauphin, Elk, Forest, Fulton, Greene, Huntingdon, Indiana, Jefferson, Juniata, Lawrence, Luzerne, Lycoming, McKean, Mercer, Pike, Schuylkill, Somerset, Sullivan, Union, Venango, Washington, Westmoreland, and Wyoming counties.
South Carolina: Chester and Union counties.
Utah: Weber county.
West Virginia: Boone, Cabell, Fayette, Grant, Greenbrier, Harrison, Marshall, McDowell, Ohio, and Upshur counties.
Wyoming: Lowes Arapahoe Cattle Association, Wind River Indian Reservation, Fremont county; and Arapahoe Ranch Tribal Enterprise, Wind River Indian Reservation, Fremont and Hot Springs counties.

[2] **An official vaccinate** is a bovine animal vaccinated against brucellosis from 4 through 8 months of age, or a bovine animal of a beef breed in a range or semi-range area vaccinated against brucellosis from 4 to 12 months of age. Vaccination is done under the supervision of a federal or state veterinary official with a vaccine approved by U.S.D.A. The animal must be permanently identified as an official vaccinate and reported at the time of vaccination to the appropriate state or federal agency cooperating in the eradication of brucellosis

From Hoard's Dairyman

it may desire after the animal has arrived in the state. Of particular importance, of course, is the fact that an illegal movement of cattle is a federal offense.

Purebred cattle owners will be interested also in the provisions that purebreds which have been moved interstate for breeding purposes and subsequently react may be reshipped interstate to the original owners.

Cleaning and disinfection of vehicles and marking of records to indicate that reactors are in the shipment is included in the new regulation. Each railroad car, boat, or other vehicle in which reactors are transported interstate must be cleaned and disinfected under the supervision of a federal or state inspector or an accredited veterinarian. This must be done immediately after unloading.

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ERADICATION OF HOG CHOLERA

Report by J. Milligan, D.V.M., Alabama State Veterinarian, Montgomery, Ala.

The Committee report reemphasized that the eradication of hog cholera was not possible so long as mass production and field use of virulent virus is permitted.

This important Committee rated national attention in 1951 when the possibility of eradicaion of hog cholera was suggested. Though limited progress has been made, continued study conferences reaffirm the elements of the earlier report before this group. This year note has been taken of the fact that incidence of the disease is less than in years immediately preceding and substantial credit is given to the requirements of state garbage cooking laws. It was noted that approximately 90% of all garbage now fed is heat treated sufficiently to destroy any possible infective agents. In this exist exciting prospects for eradication.

At the time of reporting, eight states have outlawed the use of virulent simultaneous virus. Perfection of live modified virus vaccine, their widespread use, and the proved efficacy of inactivated vaccine have effected a downward trend in the use of virulent virus. Estimate of approximately 72% of all hogs vaccinated in 1956 were injected with the new modified virus vaccine; only 28% received fully virulent virus and antiserum.

The Committee proposed that the U. S. Livestock Sanitary Association take a positive attitude toward eventual eradication and furnish necessary leadership to encourage such a program to begin immediately. Suggestion was made that this might be initiated by a pamphlet for distribution to all interested segments of the swine industry. The following action was also recommended:

1. That the Association recommend establishment within the framework of the Animal Disease Eradication Branch, A.R.S., USDA, a section for the operation of the program.

2. That budget allowance be made in the future for the conduct of a complete and effective control and eradication program.

3. That the U. S. Department of Agriculture ban production for sale and distribution all virulent hog cholera virus for field use to be effective not later than January 1, 1958.

4. Discontinued use of virulent virus at public stockyards.

It further recommended that the following measures be taken by all states:

1. Discontinue use of fully virulent hog cholera virus as an immunizing agent for swine moving from all places of public sale.

2. Promote legislation or regulations prohibiting the field use and sale of simultaneous virus.

3. Heat treat all garbage used for swine feed.

4. Include hog cholera on the list of reportable diseases.

5. Encourage laboratory confirmation of reported cases.

6. Prohibit movement of swine from premises where diagnosis has been made until reasonable danger of spread of infection no longer exists.

7. Take action to assure proper disposal of all carcasses dead of the disease.

8. Prohibit movement of swine immunized with virulent virus for period of 21 days after inoculation.

9. Clean and disinfect all facilities used in the handling of hogs infected with or exposed to cholera.

10. Develop and distribute informative material and otherwise indoctrinate practitioners and owners on the need for and value of eradication of hog cholera.

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Tranquilizing drugs have been reported to influence the reproductive cycle in females. An experiment with monkeys (*Science*, Oct. 19, 1956) indicated that when the drug was given to females early in the monthly cycle menstruation was suppressed.

PARASITIC DISEASE

Report by F. R. Kautz, B.S., D.V.M., M.Sc., Columbus, Ohio.

The Committee devoted its report this year to matters relating entirely to scabies in sheep and cattle. Reason given is that serious outbreaks have occurred during the past year that have meant significant increases in the incidence of this group of diseases in both sheep and cattle. Cited was the annual report of the Special Disease Eradication Section, USDA, which noted that increase of scab in sheep approximated 37% in numbers of flocks and an increase of 20% in the number of counties involved. The report of 607 infected flocks in 267 different counties suggests that the disease is widespread in certain areas of the Midwest range country.

Mites causing scabies or mange in sheep belong to five genera: Psoroptes, Chorioptes, Sarcoptes, Demodex, and Psorergates (the latter a newcomer in the United States first reported in 1951). The first named of the groups causes greatest damage; others are of less economic importance. At one time sheep scab was present in almost every state and caused vast losses. Federal quarantine and control procedures brought it under practical control but never complete eradication. At this writing, psoroptic scabies is present chiefly in limited areas of the Midwest, and some southern and eastern states.

Mites found on cattle belong to one of four genera: Chorioptes, Psoroptes, Sarcoptes, and Demodex. The common scab mite, Psoroptes, was prevalent at one time but now is rare. Sarcoptic and chorioptic scab is now replacing the common scab mite in prevalence. Psoroptic scab was diagnosed in 1956 in five western range states, chorioptic scabies in a number of the livestock expositions in the mid- and far west, and sarcoptic mange in two states. Demodectic or follicular mange in cattle is far more prevalent than supposed.

Recommendations for control have followed discussions between interested groups. Finding the scab and wiping it out can be depended upon if vigorous action is pursued. Education material recently prepared is assisting in understanding habits of the parasites and the economic necessity of its being stamped out.

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PUBLIC HEALTH

Reported by W. L. Bendix, D.V.M., Richmond, Va., chairman.

The Committee dealt at length with matters concerning their efforts in cooperation with others in supporting sensible legislation governing the conduct of poultry inspection. Supported was the effort to include poultry under the Meat Inspection Act of 1906 by amendment to that act. Referred to was manipulation by some groups including poultry processing interests in sponsoring bills that would fail to effect needed changes and provide the sort of inspection for wholesomeness that consumers have a right to demand. (See VETERINARY MEDICINE, 51:212 [May], 1956; 51:391

Typical appearance of small abscesses along shoulder and brisket characteristic of demodectic mange in cattle.

[Aug.], 1956). All proposed legislation died with the 84th Congress, but new bills are almost certain to be introduced early during the coming session.

Reemphasized was the conviction that best interests of consumers would be served by placing inspection of poultry for wholesomeness with the Meat Inspection Branch, A.R.S.

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INFECTIOUS DISEASES

Report submitted by M. G. Fincher, D.V.M., Head, Department of Medicine and Obstetrics and Director of Ambulatory Clinic, New York State Veterinary College, Cornell University, Ithaca, N. Y., chairman.

Virtual eradication of tuberculosis and the possible eventual eradication of brucellosis should lend increased interest toward research

Dr. Myron G. Fincher

into effective control procedures on other equally important anomalies.

Bovine mastitis, which may be acute or chronic and that has many and varied causes, is the most important disease of dairy cattle.

Facts known about mastitis have so far advanced to warrant an optimistic view of control but not of eradication. Mastitis due to infections other than *Strept. agalactiae* and to environmental causes remains a control threat in all herds. More research is needed to develop better control methods. Specific preventive measures that should be practiced in all herds must be encouraged everywhere.

Vibriosis

Of rather recent importance, *Vibrio fetus* has largely replaced brucellosis as a prime venereal pathogen responsible for widespread disease. The recommendation for the addition of an antibiotic mixture to semen prior to artificial insemination has provided the means for complete control in a large number of beef and dairy herds. Chemotherapeutic treatment of individual cases is to be commended though in the majority of problem herds, it is essential to eliminate all sources of vibriosis as it is to eradicate brucellosis. This is epecially true if breeding stock is being sold.

Since the report of the Committee in 1955, additional information has been supplied concerning the respiratory — mucosal disease — virus diarrhea complex. It is now established that infectious bovine rhinotracheitis (IBR) is caused by a specific virus, distinct from the etiological agent or agents of mucosal disease or virus diarrhea. Differential diagnostic tests or technics for these diseases are urgently needed.

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EXOTIC DISEASES

Report by F. A. Todd, D.V.M., Washington, D. C., chairman.

This Committee has pursued exhaustively all information available on a sizeable group of diseases not now present in the United States. The volume devoted to all phases of each of the most common and dangerous of these was submitted as the Committee's report at Omaha in 1954: (Foreign Animal Diseases: Their Prevention, Diagnosis, and Control.) Efforts have been devoted to a review of activities and encouraging attendence to the series of regional meetings (six) held at various locations in the United States during the year. These meetings were devoted to lectures and the showing of films prepared by the Agricultural Research Service who with the various state sanitary officials sponsored the programs. Approximately 1,000 veterinarians and veterinary students attended these six regional meetings.

Plan of the Committee is to continue cooperatively with the A.R.S., Department of Defense, and the Federal Civil Defense Administration in the development of instructional material including lectures, publication of papers, slides, and films. Further activity is being extended toward definitive diagnosis of certain foreign disease. Determination, acquisition, and distribution of selected antigens, sera, and antisera, and other required biologics needed for the diagnosis of certain foreign disease are being developed in connection with preparation of procedures for laboratory diagnosis.

The Committee recommended that the educational program begun be continued and

stimulated. It also encouraged that special courses be arranged either as credit courses or elective without credit in veterinary schools.

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ANAPLASMOSIS

Report by K. J. Peterson, D.V.M., Oregon State Veterinarian, Salem, Oregon.

One year ago this Committee reported that incidence of anaplasmosis was static. At that time it was concluded to be impractical to attempt any control or eradication program that included test and slaughter technics.

Since that time a program of eradication has been initiated in the Hawaiian Islands which promises success. Animals reacting positive to the complement-fixation test are slaughtered and quarantine and negative tests are required before restrictions are lifted on imports. The thought now is that the disease is spreading because of carrier animals. In consideration of the proved reliability of the complement-fixation test and newly developed insect sprays and repellents, together with the use of chemotherapeutic agents in both acute stages and on carriers, that it may now be possible to control, even eradicate this disease in at least some limited areas of the United States. To be determined is existence or importance of wild life reservoirs.

Anaplasmosis is under intensive study by a number of research groups over the nation and in Hawaii. These cover various phases of the problem from epizootological aspects to possibility of prophylactic vaccination.

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BIOLOGICALS AND PHARMACEUTICALS

Report by Hadleigh Marsh, D.V.M., Montana State Veterinarian, Helena, Mont.

No outstanding new developments in immunizing agents have been reported during the past year. Some products have been improved and added information accumulated on others. Only three new products have been licensed by the Biological Products Licensing Section of the A.R.S. since June 1955. The Committee expressed an opinion that use of chemotherapeutic agents in a variety of ways may have influenced activity in the biological field. Use of immune antiserum of all types also has been decreasing and several of those employed for years have virtually vanished from market channels.

In reference to a number of selected biological products, the Committee commented in detail:

Hog Cholera Vaccines. Eight states have prohibited the sale and use of virulent virus. These are Alabama, Georgia, Lousiana, Mississippi, Montana, North Dakota, Tennessee, and Wyoming. While none of these are among the important swine producing states of the Corn Belt, in some the breeding and feeding of swine is growing or has reached a stage of considerable importance as a general farm practice.

According to official information, field use of virulent virus has decreased in the United States from approximately 40,000,000 doses in 1951 to 10,000,000 for the year ending June 30, 1956. This represents 28% of the total number of swine vaccinated. During the past year (1955-1956), 42% of all hogs vaccinated received live-modified virus with a minimum dose of antiserum, and 25% were injected with the virus vaccine alone. Only 5% were treated with inactivated vaccine.

Erysipelas. The new avirulent antigenic strains of *E. rhusiopathiae* have now had rather extensive field trial. Results are reported to be satisfactory. Antigenicity is demonstrable and duration of immunity though not clearly defined, will probably carry pigs to market age.

Anthrax. The Committee commented on the use of the new Sterne vaccine in this country and stated that field results indicate that it is a satisfactory agent.

Leptospirosis. Diagnosis of leptospirosis has been handicapped because of the complex nature of laboratory diagnostic tests. A standard *L. pomona* antigen suitable for rapid plate testing is now licensed and commercially available. Dr. H. Stoenner of the Hamilton Montana Public Health Laboratory is credited with the development of the practical test.

Leptospirosis bacterins (*L. pomona*) grown on special media or in chicken embryo are now offered practitioners. A combined *L. canicola* and *L. icterohemorrhagial* bacterin for protection of dogs has also been announced.

Encephalomyelitis. Because of cross immunization difficulties race horses who are moved from track to track in widely separated locations must be protected against both the eastern and western type. A concentrated bivalent vaccine that is claimed to afford protection against both types on intradermal administration of 1 cc. has been approved by the Agricultural Research Service.

Outbreaks of encephalomyelitis in ranch pheasants has presented problems of control

(Continued on page 20)

The Effect Of Low-Level And Therapeutic Administration Of Phenothiazine On The Color Of Cow's Milk†

JOSEPH E. ALICATA,* Ph.D., and OLIVER WAYMAN,** Ph.D.,
Honolulu, Hawaii

PHENOTHIAZINE is one of the most common drugs recommended for the control of gastrointestinal nematodes of ruminants. The use of this drug for lactating animals, whose milk is used for human consumption, has been regarded as contraindicated for the reason that the milk may develop a pinkish discoloration. As stated by Enzie and Kurtpinar[1], the color is due to catabolic derivatives of the drug which are regarded as harmless to the consumer. In a series of observations carried out by these writers, it was determined that milk from goats receiving 2 or 3 gm. of phenothiazine daily usually developed a pinkish discoloration when exposed to air. They found, however, that with a daily dose of 0.5 and 1 gm. discoloration was less frequent and generally detectable only when the milk was compared closely with a control sample. In addition, they found that following a therapeutic dose of 25 gm. the milk showed some color during the first two days, but resumed the essential normal appearance on the third day.

The use of phenothiazine in low-level or in therapeutic doses among dairy cattle has often been discouraged for the reason given above. However, as far as the writers are aware, only limited information is available in the literature in this respect. Bruce[2] reported that doses of 1 gm. per hundredweight daily to lactating cattle produced some discoloration of the milk. Wise, James, and Anderson[3] reported discoloration of the milk following large doses of phenothiazine, namely, 125 gm. per animal. The present study was carried out to determine if phenothiazine administration to cattle in recommended amounts of 2 gm. daily for low-level feeding and a maximum of 60 gm. for therapeutic doses would alter the color of the milk.

Materials and Methods

The study was carried out with the use of dairy animals maintained at the University of Hawaii Farm. The cows used were largely those whose milk production at the time of the observation was comparatively low. This was done because any evidence in milk discoloration would possibly be greater among such animals.

In observations on the effect of low-level administration, the drug was mixed with the concentrate and fed in such amounts that each animal received 2 gm. daily. Samples of milk (1 pt.) from these animals were thereafter obtained each morning, beginning with a day

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*Parasitologist, **Animal Scientist, Hawaii Agricultural Experiment Station.

after the drug was fed in the feed. Samples of milk from control animals were also collected for comparison. For each of the first group (A) of nine animals indicated below, 20 cc. of the milk was poured in sterile test tubes and pasteurized by heating it in a water bath until the temperature reached 170 F. and maintained for 15 seconds. The tubes were then plugged with cotton and kept in a refrigerator for four days. Once each day the milk was examined for discoloration, and the tubes were inverted several times to mix the milk. On the last day the milk was poured into large Stender dishes and exposed to the air at room temperature for six hours before being discarded. For each of a second group (B) of animals indicated below, the bottles of milk were stored in the refrigerator for four days and examined daily. On the last day about 60 cc. of the milk was poured into Petri dishes and exposed to the air for six hours. This method of exposing a larger sample of milk in a larger container, rather than the use of a 20 cc. sample in a smaller container as before, was carried out with the assumption that it might offer a better method of detecting any evidence of discoloration.

In observations on the effects of therapeutic doses on milk discoloration, the animals were drenched in the morning and milk samples were then collected for four subsequent days. A pint of milk from each of these animals was kept in the refrigerator and examined as in group B.

Results

Low-Level Administration. Two groups of animals were used for this trial at different times. Beginning September 20, 1955, nine cows (group A) were started on low-level drug feeding, and this was continued for 12 days. The number of each cow and the average pounds of daily milk produced (shown in parenthesis) computed from milk produced for one week just before the drug was fed are as follows: 268 (19.4); 289 (13.0); 315 (24.3); 361 (7.3); 363 (18.1); 367 (23.5); 370 (14.3); 373 (24.0); and 376 (8.2). During the 12 days' trial none of the milk from these animals, except one (cow 361), showed evidence of discoloration. For cow 361, which was near the end of lactation period, the milk began to reveal slight pink discoloration beginning with the 8th day (September 28) of the drug feeding; at that time the animal was giving 4.3 lb. of milk per day. In subsequent days discoloration of the milk increased slightly so that by the 12th day (October 2) the milk was judged slight pink. On that day the milk output had decreased to 3.2 lb.

Beginning April 10, 1956, another group of four cows (group B) was started on low-level phenothiazine feeding and continued for a total of eight days. The number of each cow and the average pounds of daily milk produced (in parenthesis) for the week before the drug was fed are as follows: 306 (15.7); 326 (16.7); 374 (20.6); and 381 (20.7). During the eight-day trial, none of the milk from these animals showed evidence of discoloration.

In connection with low-level phenothiazine administration, 2 gm. per day appears to have no effect on milk production nor on the taste of the milk. During the week before low-level treatment started, the nine cows of group A produced a total of 1,067.6 lb. of milk. For the week after low-level started, the same animals produced 989.5 lb., or a reduction of 78.1 lb. in comparison with the preceding week. This decrease, however, was also noted among nine control animals who for the same period produced 1,677.2 lb. before and 1,534.6 lb. after drug feeding, or a reduction of 142.6 lb. of milk. The writers failed to detect any off-flavor in the unpasteurized milk samples from three cows (315, 367, and 370) which were tasted daily for one week during the low-level feeding.

Therapeutic Administration. For this trial, utilization was made of the four cows of group B soon after the low-level feeding was terminated. The animals were treated on April 18, 1956, and each received a drench of 60 gm. phenothiazine. The number of the animals and their average daily milk production (pounds shown in parenthesis) for the week previous to treatment are as follows: 306 (14.1); 326 (12.8); 374 (14.4); and 381 (19.3). Of the milk samples collected during the first day after treatment, one (326) showed definite pink color, two (306, 374) showed slight pink color, and one (381) very slight pink. Milk collected on the second day showed decreased discoloration, slight pink for one (326), very slightly pink for two (306, 374), and only slight difference than the control for one (381). On the third day all the samples of milk appeared normal. All the discolorations were evident on the last day following refrigeration and exposure to the air in the Petri dishes. None of the samples secured from the control animals showed discoloration at any time. The above limited data show that the intensity of discoloration was inversely pro-

portionate to the amount of milk produced and is in accord with observations of Enzie and Kurtpinar[1] in similar studies with goat milk.

Discussion

The findings reported in the foregoing indicate that phenothiazine when administered to cows in the recommended low-level of 2 gm. per day does not ordinarily cause discoloration of the milk or alter milk production. These findings suggest the usefulness of feeding low-level phenothiazine to dairy cattle grazing in areas where they may contaminate pastures used by young grazing stock. If such a possibility does not exist, the value of low-level feeding to dairy animals is questionable. When the drug was administered therapeutically, the milk showed discoloration for at least the first two days and indicates that such milk is not suitable for human consumption. On this account, the treatment of lactating cows with therapeutic doses is not ordinarily recommended, unless the animals possess a high degree of infection with gastrointestinal nematodes.

Summary and Conclusions

Phenothiazine mixed with concentrate feed and given to 13 lactating cows at the rate of 2 gm. per day did not cause discoloration of the milk among 12 of the animals. The average daily milk produced by the 12 animals varied from 8.2 to 24.3 lb. One of the 13 cows, however, whose milk output was reduced to 4.3 lb. per day developed slight pink discoloration of the milk.

Sixty-gram therapeutic doses of phenothiazine administered to four lactating cows producing from 12.8 to 19.3 lb. of milk per day resulted in discoloration of the milk during the first two days. The milk, however, resumed its normal appearance on the third day.

It is concluded from the present observations that low-level phenothiazine feeding may be safely instituted among dairy cows which are not near the end of the lactation period and under conditions where they are kept in pastures which are also used for the grazing of young stock. If the possibility of pasture contamination does not exist, this form of feeding is questionable. The recommended therapeutic dose of phenothiazine does produce milk discoloration for the first two days and for this reason such milk should be withheld from distribution for a period of at least two days.

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Field Application of the C-F Test for Anaplasmosis

Although the complement-fixation test for anaplasmosis has been established as a practical and valuable diagnostic technic, little use has been made of it.

Roby and associates report successful control of the disease in a dairy herd in the Hawaiian Islands* where an expanding eradication program has called for removal of reactors for slaughter. Incidence of the disease has been markedly reduced and new quarantine measures plus negative complement-fixation test are requisite to entry of all cattle to the Islands.

The test has also been used on three herds in different parts of the United States in an effort to stem spread of infection. Some favorable results have been reported and testing, disposal, and segregation are being continued.

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Biologicals and Pharmaceuticals

(Continued from page 17)

on these farms. In addition, studies are in progress to determine the hazard of this infection in birds to human health.

Pharmaceuticals

Though pharmaceutical agents are of secondary importance to regulatory and control matters, some have proved effective in reducing infection and danger of transmission. Most important of these are classified as antibiotics. Several new ones have been made available.

During the meeting at New Orleans last year, this Committee proposed that a laboratory be established whose operation would come under the supervision of the A.R.S. to check-test licensed veterinary products for safety and to develop methods for critical testing for efficacy of biological products produced by industry prior to and after licensing. It is understood that the new laboratory scheduled for construction at Ames, Iowa will undertake such a project.

*To be published in Proceedings Book of the 60th Annual Convention of the U. S. Livestock Sanitary Association.

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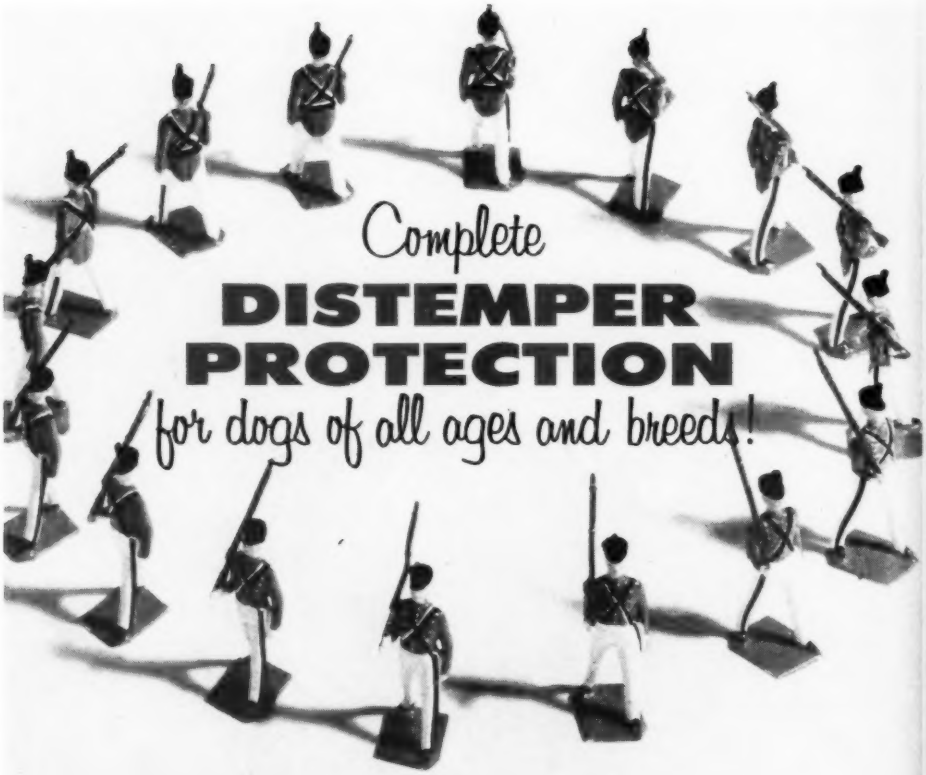

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Practical Small Animal Diagnostic Roentgenography†

B. F. HOERLEIN, D.V.M., PhD., Auburn, Alabama

ONLY in recent years have courses in radiology been a part of the veterinary curriculum. The remarks in this article are not, therefore, directed at the recent graduate, but to clinicians who are using or intend to use diagnostic *x*-ray procedures who have not had this training. The author has found some of the following suggestions helpful in daily clinical radiography.

Preparation of Patient

Preparation of the patient is of prime importance in good radiography. If a procedure is worth doing, it is worth doing correctly from beginning to end. Gastrointestinal radiographs are best secured with a relatively empty intestinal tract. Fecal material or ingesta will obliterate the pelvis or lumbar vertebrae in ventrodorsal or dorsoventral positions. Ingesta obliterates genitourinary studies. An extremely dirty animal should be bathed or at least brushed before submitting it to radiographic examination.

Movement

One of the greatest difficulties in veterinary radiographic interpretations is movement of the patient. This is largely due to two factors; one is lack of patient cooperation in holding still, and second, the use of lower voltage equipment which necessitates longer exposures. Compression bands aid a great deal in immobilization of a part, however sedation with opiates or complete relaxation with ultrashort acting barbituates are often necessary.

Often a little patience will give one the pause necessary for proper exposure. The operator attempting chest exposures will often notice a pause during respiratory movements as the animal lies on the table. This greatest pause is usually at the end of exhalation. Also, gentle pressure on the nostrils will often stop respiratory movements long enough for the exposure. However, this should be tried once or twice to obtain the dog's reaction, since it makes some animals struggle rather than quit breathing. (Fig. 1, 2.)

Positioning

Positioning should be standardized for the various parts to facilitate more accurate exposure and interpretation. If a slight deviation in position is obtained, a normal situation frequently may be misconstrued as an abnormality. On the other hand, a pathological lesion may be obscured or misdiagnosed. This is especially important in the diagnosis of congenital hip dysplasia, where the abnormality can be overlooked if the weight bearing surface of the femur is not positioned correctly. (Fig. 3, 4 and 5, 6.)

Positions recommended are as follows:[1, 2, 3]

1. Brain and cranial vault—VD*.
2. Nasal sinus, mandible—DV**.
3. Spinal column—side (lateral), VD or DV.

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†Paper no. 702 Presented at the 23rd annual meeting of the Florida State Veterinary Medical Association, September 24, 1956, Pensacola.

Professor, Small Animal Surgery and Medicine, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn.

*VD—Ventrodorsal or dorsal recumbency.

**DV—Dorsoventral or sternal recumbency.

***AP—Anteroposterior.

4. Thoracic viscera—usually a lateral and VD or DV is the most convenient, however if fluid or exudate is present, a standing position is preferable in order to obtain a fluid line.

5. Abdomen—lateral and VD or DV.

6. Fractures—two views at all times, e.g.—AP*** and lateral. (Fig. 7, 8.)

Fig. 1. A chest radiogram of a patent ductus arteriosus. Notice the blurred images because of extremely rapid respiratory movements.

7. Humerus, scapula—affected limb down, the animal obliquely dorsal lowermost with the upper limb pulled either acutely forward or backward. The AP view of the humerus is difficult and the position should be determined on an individual animal basis.

8. Femur—the lateral view is the same as for the humerus. The AP of the femur is taken with the dog in a sitting position with the affected leg extended forward or with the dog in dorsal recumbency and the affected leg drawn posterior similar to the hip position.

9. Hip and pelvis—VD, with the hind limbs drawn straight backward and the hocks rotated slightly inward.

Identifying Films

The identification of films at the time of exposure is a must in proper clinical procedure. Not only is this necessary for proper filing but in VD or DV exposures of the abdomen, thorax, pelvis, or skull the side should be marked. Especially is this essential where surgery is anticipated so as to correctly determine the incision site and correction. This factor may seem elementary but is an easily forgotten detail.

Type of Film

The correct *type* of film will lead to more detail in the exposure and therefore more correct interpretation. *X*-ray film is ordinarily manufactured as screen and non-screen film. Screen film depends on fluorescent light (from the intensifying screens) as well as the direct *x*-ray energy for exposure. Therefore, this process greatly speeds up exposure but does so at the expense of detail. In extremity exposures or thin parts, fast exposure is not needed and actually is undesirable, therefore non-screen film be used.

Non-screen film is usually used in cardboard holders or is prewrapped in light proof paper. Since *x*-ray energy alone produces the chemical change in the film, a great deal more *x*-ray energy is needed for exposure. This slower action then produces much more detail in thin or extremity parts. Characteristics of bone tumors, infections, and presence of foreign bodies in soft tissue are more easily seen with this type of film.

Scattered Radiation

One of the most helpful procedures in thick soft tissue parts, such as the abdomen, is to use a means of limiting scattered radiation. Soft tissue may not be dense enough to absorb *x*-rays but deflects (bounces and bends) them around in the part before they reach the film.

Fig. 2. The same animal as in fig. 1, however movement was stopped more effectively by sedation and oxygen therapy.

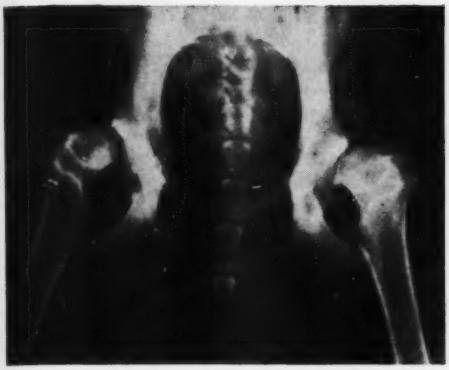

Fig. 3. Congenital coxofemoral subluxation as observed in the routine pelvic position when a compression band was placed tightly over the thighs.

Fig. 4. Same dog as in fig. 3, however the appearance of the dysplasia assumed a much different appearance when no compression band is used on the thighs.

This phenomenon greatly interferes with detail and contrast, producing a "muddy" film.

Some of the things said to lessen scattered effect are to limit the size of the field exposed (cone) and to use as little kilovoltage (KV) as possible to penetrate the part. However, the most effective apparatus to produce the desired effect is the grid, either stationary or moving (Potter-Bucky diaphragm). The Bucky is a more expensive item to install, however it leaves no grid lines on film if properly used. A stationary grid is a less expensive item and is effective, however it does leave fine grid lines on the film. Such grid lines are not disturbing since they are seen only at close inspection. The stationary grid is highly satisfactory for the practicing clinician. (Fig. 9, 10.)

Exposure Charts

Since most veterinary clinician are not highly trained radiologists, complicated exposure charts (often human in origin) are confusing. At least for the novice, it is well to use as many constants in exposure technic as possible. The film anode distance, Ma, and exposure time can all be kept constant, leaving only the KV and thickness of the part as variables. Instead of making charts for guides, the author has used graphs based on the above constants and variables. The KV is graphed against the thickness of the part. To establish this exposure line, a thin and a thick part are correctly *x*-rayed. This line drawn between the two points is then an approximate guide for future exposures. (Fig. 11.)

Fig. 5. The appearance of coxa plana when the legs were not in the recommended position. The femoral heads appear quite normal here. This is a screen no grid exposure.

Fig. 6. The same animal as in fig. 5, however the dog is in the proper position. Notice the marked coxa plana and arthritis present. This is a screen grid exposure.

Fig. 7. Lateral view of a supra-condyloid humeral fracture. Notice the lack of displacement.

Contrast Media

Abdominal visceral organs especially are relatively non-radiopaque and because of their similar density do not frequently distinguish themselves in an ordinary radiogram. This is especially true of the intestinal and genital tracts. Therefore the use of contrast media such as barium and bismuth preparations have been widely employed. Since barium sulfate is extremely radiopaque, it is usually better to mix such material in a semibulky vehicle such as a cellulose or a mucin preparation in order to distribute it more widely.

Air or oxygen are easily and efficiently used in the urinary bladder as an aid in demonstrating cystic calculi. Air is introduced (20-100cc.) by means of a syringe through a catheter and a cystogram is immediately taken. Air or oxygen can also be placed in the peritoneal cavity as an aid in the radiographic diagnosis of such conditions as pyometra, tumors, and pregnancy. The medium is introduced until the abdomen becomes tympanic and distended. The air will be absorbed in at least 24 hours and apparently causes no ill effect.

Many iodine compounds are used as radiopaque media. Sodium iodide (10-20%) solution has been used in the urinary bladder to aid in neoplasia diagnosis. Of course any radiopaque medium is contraindicated in calculi since they will obliterate them. Agents such as diodrast* are used in pyelography.

Fig. 8. A-P view of fig. 7. Here the displacement is marked.

Here the media is given intravenously to a dehydrated animal (no water for 24 hours) and periodic films are taken to check for elimination in the kidneys. Neoplasia, calculi, and other non-inflammatory kidney conditions

*Winthrop Laboratories, New York, N. Y.

Fig. 9. A screen non grid exposure of an esophageal tumor caused by *Spirocerca lupi*, the esophageal worm; 1. heart, 2. tumor, 3. spondylitis.

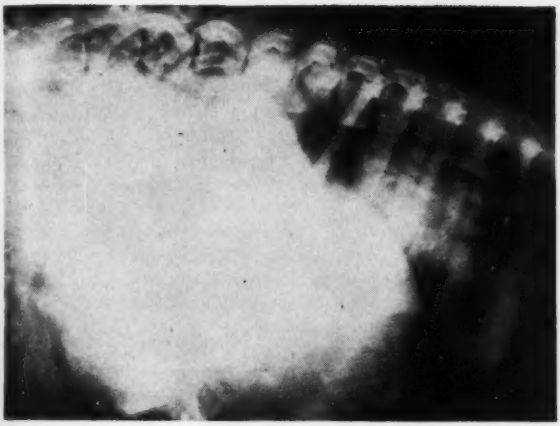

Fig. 10. A screen grid (lysolm) exposure of the same dog in fig. 9. Notice the greater contrast when a means of limiting scattered radiation is used.

would be the indications for such use. Diodrast is too toxic for myelography, however. Diodrast and other agents such as pantopaque,** lipiodol,† neoipax,†† and iodochloral§ can be used for sinus and fistulae examination.

Pantopaque, lipiodol, and thorotrast are agents frequently used in the spinal subarachnoid space to demonstrate compressions on the spinal cord. These might include fractures, luxations, tumors, or protruding intervertebral discs. Thorotrast is generally too toxic to use in the cisterna magna but might be used in the caudal portions of the cord.

There are many other possibilities for contrast media procedures not used frequently in animals. The study of vascular, cardiac, and gall bladder disorders by use of contrast radiography are beyond the realm of most canine practices, at least for the present time.

**Lafayette Pharmacal Co.
†E. Fougera and Co., New York, N. Y.
††Schering Corp., Bloomfield, N. J.
§G. D. Searle & Co., Skokie, Ill.

Protection

This subject has been discussed in detail by many radiologists. However, the veterinary clinician has many problems in restraint and patient cooperation not of concern by the human radiologist. A few practical principles the writer would like to emphasize are as follows:

1. Beware of the fluoroscope. More effective diagnostic work can be done more safely by producing *x*-ray photographs.

2. Never use an *x*-ray apparatus without a cone.

3. Always keep unprotected parts of your body out of the direct *x*-ray beam (within the coned area.) If any part of your body is close to or in the direct beam, wear leaded gloves and apron.

4. If you are doing considerable *x*-ray work, you should occasionally check your exposure by wearing a dental film packet on your shirt

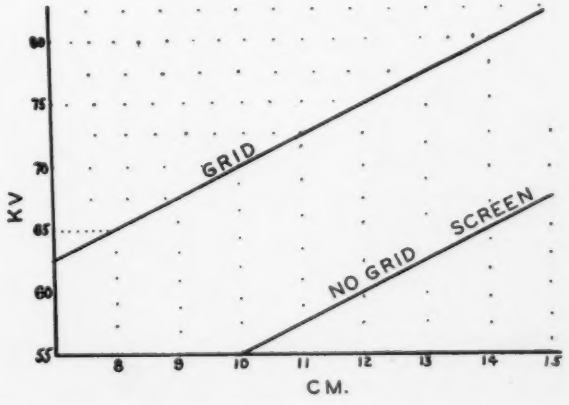

Fig. 11. An exposure graph based on the milliampere seconds, film-anode distance being kept constant, while the kilovoltage is varied according to the thickness of the part.

for 15 consecutive working days. If you can not read newsprint through it when it is developed, you are getting excessive exposure. A periodic hemogram is worthwhile as a further check on toxicity.[4]

Summary

The following suggestions are offered to the practicing veterinarian employing roentgenography:

1. Careful patient preparation.
2. Complete immobilization as aided by sedation or anesthesia of short duration.
3. Meticulous positioning.
4. Identification of the film as to case and the animal's side in midline exposures.
5. Screen and no-screen film should be used for the purpose they are designed; non-screen for detail in extremity and thin parts.
6. A stationary grid or Bucky are valuable means of limiting scattered radiation in thick soft tissue exposures.
7. A graph will serve as a practical efficient exposure guide.
8. Contrast media are helpful in visceral radiography.
9. The insidious nature of *x*-rays present a constant danger to the clinician. *Protect Yourself.*

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"Doctor for Your Dog or Cat"

The above designates a frank and essentially accurate article appearing in *Changing Times* for November 1956.

The unidentified author introduces his readers to the modern veterinarian with facts, not flattery, nor does he attempt to be complimentary. The final results are praiseworthy and the article is recommended to readers as an excellent piece of public relations.

Some matters of necessary preparation are mentioned which is followed by what the practitioner can do for the hurts and ills of dumb animals. Source of statistical material is not mentioned but appears to parallel official releases from authorized sources. The overall average net income for practitioners is set at $8,000. annually.

Owners of pets are instructed to seek qualified sources of information about the health of their animals and this is tempered in a practical fashion assuring new owners that it isn't necessary or sensible "to rush your pet to the veterinarian every time he sneezes." Briefly outlined in an editorial box are a few first-aid hints or suggestions for home care that suggest the value of knowing when to call for professional assistance.

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Story Ideas Wanted for Noah's Ark

The producers of Noah's Ark, a weekly television program featuring two veterinarians, have requested ideas from veterinarians to assure that the popular series cover a variety of subjects and cases such as those referred to practitioners.

It is understood that submission need not be long or detailed. They should contain brief background material, diagnosis, treatment, aftercare, and results. Include any human interest angle in connection with the story that may be humorous, dramatic or tragic. Mention all drugs employed, anesthesia in surgery, et cetera, including time of treatment and recovery.

Mark VII Ltd. producers will pay $100. in advance for any idea used as the basis for a script. Stories and incidents may involve any species so long as they are acceptable from an esthetic viewpoint.

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Cyanide Poisoning

It was interesting to read in a late issue of a medical journal (*Jour. Am. Med. Assn.*, [Nov.] 1956, p. 1154) the method employed by physicians in the handling of two cases of acute cyanide poisoning. The treatment used was in general the same as that resorted to by veterinarians in acute prussic acid poisoning in cattle after these animals have consumed cyanide containing plants such as sudan grass, cane, and sorghum *i.e.*, by intravenous use of methylene blue, and/or sodium nitrite — sodium thiosulfate solution. Good results were reported for both of the affected patients.

New Approach To Control Of Nonspecific Diarrhea With *Lactobacillus Acidophilus*

J. W. MERRICK, B.S., D.V.M., Kenosha, Wisconsin

SINCE the dog is by nature a scavenger, enteritis is one of the most common conditions for which these animals are presented for treatment. Numerous infectious conditions, parasitism, overeating, pica, chemical irritants, and nervousness may be responsible for inflammatory processes of the digestive tract. The majority of cases are treated with various antibiotics, sulfonamides, vermifuges, and protectants. Some cases are difficult primarily because they tend to recur after apparent relief of all symptoms. These cases have stimulated clinical investigation of an antidiarrheal product largely overlooked by practitioners handling pet animals.

In examining the broad picture of nonspecific enteritis one must attempt to determine as accurately as possible pathological changes in the digestive tract. Various saprophytic and commensal bacteria, yeasts, molds, fungi, and protozoa are physiological in the animal intestine. Many of these have specific role in digestion. Under normal conditions others have little or no known function though some are known to be pathogenic only under certain abnormal conditions. Furthermore, acid reaction in the stomach of the dog keeps the number of harmful bacteria to a minimum.[1]

Most cases of enteritis can be controlled with symptomatic treatment. In some others, diarrhea may persist even though the initial causative agent has been removed. Undoubtedly, this can be traced, at least in part, to a lack of normal digestive bacteria in the colon. In chronic enteritis, the pH of the colon is raised, thus making way for easy growth of Gram-positive cocci and rods.

Lactobacillus (lactinex)® tablets or granules have proved effective in controlling many types of diarrhea syndromes observed in our practice. Lactinex contains a standardized viable mixed culture of *Lactobacillus acidophilus* and *Lactobacillus bulgaricus* with naturally occurring metabolic enzymes that are produced by these organisms. The product can be given in tablet or granular form, or mixed in food or milk. In simple digestive upsets of an uncomplicated nature, beneficial results can be expected within 24 to 72 hours. Naturally, long standing conditions usually require lengthier treatment.

Dr. J. W. Merrick

This method of treatment is not new. Yoghurt (soured milk culture) has been used for centuries as an agent for relief of certain human digestive ailments. By reinoculating the intestinal tract with viable Lactobacillus organisms physiology is reestablished and return to normalcy facilitated.

There appear to be no detailed reports in the literature of the normal bacterial flora of the gut of the dog.[2, 3] Tainter[4] states that *Proteus vulgaris*, coliforms, and non-pathogenic Corynebacteria, exist in the normal gut.

The relative length of small intestine in man and dog is practically equal. Also the pH of the colon of man is similar to that of the dog; therefore it seems safe to assume that bacterial action would be essentially similar in both species. Work done on similar conditions in

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man indicates that overgrowth of Gram-positive bacteria may occur, which surpresses growth of the normally predominant Gram-negative organisms. The alkaline content of the ileum is then no longer neutralized by the Gram-negative acid-producing colon bacteria, and the fecal mass passes through the large bowel maintaining a high pH. Likewise, action of the proteolytic enzymes is also impeded. Zinsser[5] states that Gram-negative colon bacteria normally constitute about 75% of the intestinal flora, with Gram-positive rods and cocci forming the remainder of the colonic organisms.

It is well-known that newborn animals, have a sterile intestinal tract. Colostrum contains a high percentage of lactobacilli and usually, this is the source of culture for the infant. Bottle-fed infants are reported to have more difficulty assimilating cow's milk. Digestive upsets are common in bottle fed babies. Here again there exists a corollary between human and canine patients. Orphan pups often experience enteric difficulties. Naturally, many of these can be traced to inexperience of pet owners, but a number are undoubtedly due to the lack of colostrum. In limited trials lactinex granules incorporated in the formula of orphan pups and squirrels gave most satisfactory results. All animals treated recovered and none relapsed during bottle feeding.

Work by Rettger[6] indicates that administration of lactose and acidophilus will result in a replacement of the putrefactive flora of the colon with an aciduric flora. Although it is not possible to produce an implantation of *L. bulgaricus* in the bowel, the prolonged use of it enhances the growth of the desirable Gram-negative bacteria by also forming lactic acid in fermentation of carbohydrate. *L. acidophilus* will establish residence in the colon and this enhances rapid return of normal flora to the bowel.

Antibiotic diarrhea, a relatively new disorder, is being diagnosed rather frequently since the current widespread use of these agents at high levels for protracted periods. Following prolonged, or indiscriminate use of broad-spectrum antibiotics a number of animals begin to exhibit symptoms of enteritis due, it is believed, to the destruction of a high percentage of the normal bacterial flora of the gut. We have found that for the treatment of this condition, lactinex is almost specific. Any clinical case in our practice requiring broad-spectrum antibiotics over a long period is now given lactinex concurrently with the medication. No enteritis from antibiotic therapy has resulted since this regime was initiated.

Of the forty-odd cases treated with lactinex during the past year, ten are described briefly. Results in these are typical of the majority.

1. One-year-old Boxer male; weight 55 lb. Intermittent bloody diarrhea for one month. Suspected foreign body. Gave enema and treated with a kaolin and pectin mixture with no results. Lactinex (1 gm. per day) resulted in a firm stool in five days. One loose stool on the tenth day after medication started; none since. One month later; weight 70 lb. General health satisfactory.

2. Weimeraner; female, three months of age; weight 14 lb. Diarrhea reported of two weeks duration. Fecal examination revealed plus three coccidia. Sulfaguanidine prescribed for five days, after which fecal examination reported negative. Mild diarrhea continued for four days. Lactinex (1 gm. per day) for five days completely relieved symptoms of diarrhea.

3. German Shepard; male, one year of age; weight 45 lb. Semisolid stools for most of his life with a profuse diarrhea persisting for several days. Had been treated by colleague who employed antibiotics which cleared up the diarrhea temporarily. Appetite good, fecal nega-

View of portion of exterior of the J. W. Merrick Hospital, Kenosha, Wisc. Exercise pens in background.

tive. Temperature 103.4F., nervous, losing weight. Gave 300,000 units of procaine penicillin and prescribed lactinex (1 gm. daily). Diarrhea relieved in five days. Symptom free after two weeks.

4. Rottweiller; male, one year of age, weight 80 lb. Intermittent mucus diarrhea of two months duration. Fecal negative. Lactinex (1 gm. per day) for 12 days prescribed. Diarrhea cleared up in seven days. No recurrence after 30 days.

5. Boxer; male, two years of age, weight 45 lb. Intermittent diarrhea for two months. Gave a kaolin and pectin mixture plus sulfonamide with no results. Fecal examination revealed ascarids. Wormed twice at ten day intervals. Diarrhea continued intermittently. Lactinex (1 gm. b.i.d.) was prescribed for seven days. Diarrhea cleared up in ten days. None since at three-week check.

6. Collie; female, three years of age, weight 45 lb. Intermittent mucus diarrhea for one month. Fecal was negative. Known to eat garbage occasionally. A kaolin and pectin mixture with sulfonamide, plus 2 gm. of lactinex was given for three days, then 1 gm. per day for six days. Stool normal after two days treatment. None since at two-week check. Six months later diarrhea returned. Similar pattern. Lactinex (1 gm. per day) for ten days. No diarrhea after 48 hours of treatment. This Collie has remained symptom free since second course of treatment.

7. Springer Spaniel; male, 18 months of age, weight 32 lb. Chronic diarrhea of three months duration. Some bloody stools and intermittent anorexia; elevated temperature; mucopurulent ocular and nasal discharge. Fecal examination revealed four plus uncinariasis and one plus coccidia. Anthelmintic administered. Tetracycline (250 mg. b.i.d.) orally for four days. Lactinex (2 gm. daily) for four days. Stools now semisolid, appetite has returned. Patient discharged with prescription for 1 gm. lactinex per day for ten days. Returned two weeks later with diarrhea and anorexia. Owner had not given prescribed treatment regularly. Lactinex (2 gm. per day) for seven days with a kaolin and pectin mixture relieved symptoms. Normal on reexamination.

8. German Shepard; female, 10 months of age, weight 40 lb. Chronic entertis of five months duration. Had been treated elsewhere. Fecal examination revealed four plus coccidia and four plus hook worms. Anthelmintic treatment indicated. Tetracycline (250 mg. b.i.d.) orally for four days with lactinex (2 gm. per day) for four days, then 1 gm. per day for seven days. Fourth day stools starting to form, one week stools less frequent and near normal. Stools normal at two-week check.

9. Fifteen orphan squirrels, approximately one week of age. Enteritis, general malaise. Had been treated with various antibiotics and sulfonamides, and antidiarrheals with no success. Lactinex granules dissolved in the formula (1 gm. in 6 oz.). Symptoms of enteritis relieved in 72 hours. Remained normal throughout nursing period. Weight gain equal to that of normal squirrels.

A second group of 12 orphan squirrels were given lactinex according to the afore mentioned schedule and none developed diarrhea.[7]

10. English Bulldog; female, five months of age, weight 40 lb. Diarrhea for ten days. Fecal examination negative. No other symptoms. Lactinex in usual prescribed dose. Diarrhea subsided in five days. None at two-week check.

Six months later this bitch was returned with intermittent diarrhea of eight-days duration. Fecal examination revealed two plus hook worms. Dog was wormed and thereafter developed a bloody enteritis. Lactinex (1 gm. per day) for five days relieved symptoms in 48 hours.

Conclusions

From the results following use of lactinex in the cases cited it appears that reinoculation of the gut should be considered when simple antidiarrheals fail or when diarrhea follows antibiotic therapy. The product appears to have considerable therapeutic value for the relief of diarrhea resulting from dietary errors, internal parasites and others of simple noninfectious etiology.

In addition to its therapeutic action, lactinex may be used as preventive treatment, especially in high-strung animals whose nervous temperment contribute to enteritis, when normal routine is upset, or after sudden changes of environment. During these times, lactinex therapy is an aid as a preventive for digestive disturbances.

Summary

1. Of the cases treated with lactinex 70% were free of symptoms of enteritis in one week and did not show a relapse when rechecked at the end of the second week. Improvement was exhibited in 20.7% after a few days of treatment with recurrence. Many of these

(Continued on page 36)

STATE-WIDE RABIES CONTROL IN GEORGIA, 1946-1956

Notes of a paper presented by L. E. Starr, D.V.M., M.S., Ph. D., Public Health Veterinarian, Georgia State Department of Public Health, Atlanta; S. M. Camp, Mammal Control Supervisor, U. S. Fish and Wildlife Service, Wayside; Robert L. Watson, D.V.M., United States Public Health Service, Macon; and Marvin Jernigan, Game Warden, Georgia State Game and Fish Commission, Macon, at the 60th annual meeting of the U. S. Livestock Sanitary Association, Chicago, Nov. 29, 1956.

Rabies is under control in Georgia for the first time in many years. Although still present the disease is confined to limited areas. There are no epidemics.

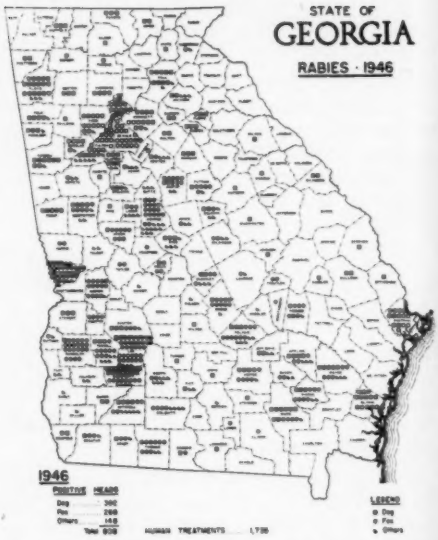
The story of control efforts in Georgia is one of valiant effort on the part of a few against obstacles without number and, except for certain areas and under extreme conditions, paralyzing apathy of county officials, objection of champions of the free dog and wildlife, and fox hunters over a period of ten years. The accomplishment has been an invaluable service to Georgia reducing not only human death rate but the anxiety and suffering of thousands required to submit themselves for antirabies prophylaxis. Cost has been negligible considered in the light of the above added to savings in losses to livestock.

In 1936, antirabies vaccine was issued for 3,250 persons. For 1956, to date, only 180 antirabic treatments have been issued in the state for human use. During the period from 1918 to 1946 three persons succumbed annually to the disease. In contrast, since the control program was initiated in 1946 only four human deaths, or less than one every two years has occurred, none of whom had had treatment because exposure was not known prior to diagnosis. This record may be pointed to with pride and it should certainly merit universal support in Georgia. Its sensible application points up value of many features in a state-wide program.

Decrease in animal rabies is directly reflected in a corresponding decrease in the relative percent of positive brains to the total examined in all laboratories in the state. From graph I it will be noted that in the years prior to 1946 approximately 45% of all brain examinations were positive either by direct brain smear or mouse inoculation test. The percent positive has steadily declined since to 8% in 1956.

History of rabies dates to antiquity yet no method of prophylaxis or protection of man or animals following exposure was known until Pasteur's demonstration of the antigenicity

MAP I



of antirabic vaccine of rabbit cord origin. Improvements in immunizing products have made possible lengthening the duration of immunity which was needed especially where mass dog vaccination programs are deemed essential. One of the problems is the objections to the application of free vaccination of dogs. This in spite of the precedence, hailed by science, of the virtual eradication of bovine tuberculosis accomplished under a plan of free compulsory state and nation-wide testing. Our present methods directed toward eradication of bovine brucellosis is reapplication of the same principles and procedure. The question can be asked, Why not free dog vaccination on a state or even nation-wide scale?

Recent advances in perfecting living attenuated virus antirabic vaccine of chick-embryo origin and hyperimmune antiserum of equine origin, have changed concepts of prophylaxis radically. Understanding of the disease, its incidence, and methods of prevention are now well enough understood to make eradication practical. Hyperimmune serum for human prophylaxis has now received sufficient field trial in Georgia to warrant its use in those cases where victims suffer severe lacerations about the face and hands. To date some 74 persons have been treated with hyperimmune serum with a "no death" record among this group. Assuming natural susceptibility, had it not been for this serum treatment approximately ten persons of the group might have succumbed.

Rabies in Dogs

Estimated number of dogs in Georgia is placed at 600,000. Those classified as unwanted or ownerless stray dogs are especial menaces. Vaccination programs combined with police measures then become necessary for effective disease control. This means cooperation of local authorities and the general population with disease control officials. These stray dogs are most likely to be exposed to rabies and are also free to disseminate it unless controlled. Approximately 75% of rabid dogs are ownerless. Well-known examples exist in

MAP II

those counties where veterinary practitioners have held vaccination clinics for years under laws whereby licensing was contingent on rabies vaccination. Outbreaks of disease have occurred in these counties simply because insufficient numbers were inoculated to provide an effective biological barrier. Free clinics, widely publicized and when dog owners were encouraged by all media to have their animals protected, has proved again and again that outbreaks can be brought under control.

The Georgia Program

The Georgia Department of Public Health and the U. S. Fish and Wildlife Service have attempted control measures though encouragement of dog owners to have their charges immunized annually. Major emphasis has been expended in known infected areas. Police measures have also been encouraged, yet of the 159 counties in the state only 12 have efficient dog pounds. Practitioners employ vaccine of their choice.

An educational program has been pursued continuously making use of all mass media available. The central office is without actual authority acting only in an advisory capacity. State assistance to counties is limited to financial means for furnishing chick-embryo vaccine and compensation of veterinarians, employed on an hourly basis, for administration. Compliance by owners is voluntary and legal action under the state laws is rarely invoked. Enforcement is vested in the county boards of health.

Infection was considered state-wide in 1946 (see map I). Rabies occurred predominantly in dogs in the rolling or mountainous northern parts of the state and in foxes and domestic animals in the south. A vigorous program resulted in vaccination of 250,000 dogs annually during 1946 to 1948. Tide of infection was stemmed somewhat particularly in the south central portions of the state during this period for reasons that a fairly effective immune barrier to epidemic was accomplished among dogs and that such a mass of the wildlife population died of rabies that the disease died out among wildlife because of lack of susceptible hosts.

MAP III

Distribution of disease in 1952 is illustrated in map II. In this it will be observed that control efforts in the south central portion of the state has resulted in reducing disease incidence. In the northern portion, and in counties of concentrated population rabies among dogs continued unabated. Because of this dangerous situation free mass immunization programs were conducted in 33 counties including metropolitan Atlanta, beginning in 1953 and continuing the past year. Number of animals vaccinated increased tremendously; in Fulton County, from an average of approximately 14,000 to 36,000, establishing an effective biological barrier to disease. There were 28 positive dogs, two foxes, and three cattle in two counties in which metropolitan Atlanta is located in 1954, and 13 dogs, one cow, and one cat in 1955. There has been one rabid dog in DeKalb County since June 1955 and none in Fulton County since August 1955. Incidence for 1956 (January 1 to October 1) are illustrated in map III.

Critical evaluation of the Georgia program confirms the recommendation of authorities regarding prevention of disease and reduction of incidence by vaccination of domestic animals, reduction of wildlife population, and adequate police measures. Under conditions in which work was carried out, promise is given in the experience recounted that though difficult, problems of control, even eradication, are not insurmountable.

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Encephalomyelitis Isolation From Insects and Squirrels

Virus isolation of eastern equine encephalomyelitis has been reported by scientist of the Georgia State Department of Health from mosquitoes and gnats trapped on three Georgia farms where equine encephalomyelitis occurred.

The California Department of Public Health also made public the isolation of the western type of this disease from four squirrels submitted from four counties of the state for rabies examination. Information obtained during an investigation that followed indicated that these gray tree squirrels were found paralyzed in one or more limbs and were easily captured.

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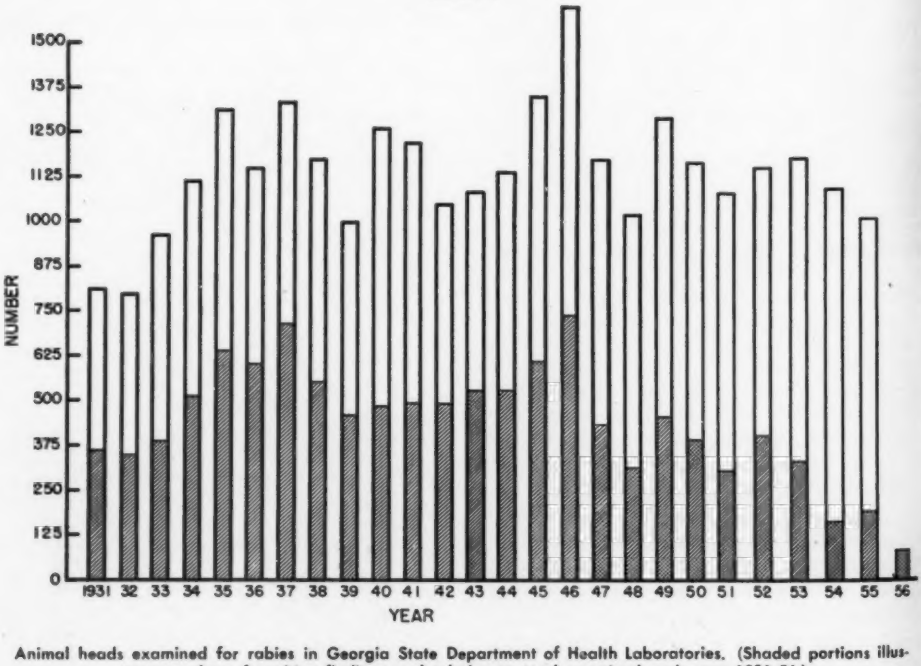
To date over 30 substances have been described as elaborated by the adrenal cortex.

GRAPH I



Animal heads examined for rabies in Georgia State Department of Health Laboratories. (Shaded portions illustrate number of positive findings and relation to total examined each year 1931-56.)

Some Activities of a Far East Air Force Base Veterinary Service

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An Air Force Base Veterinary Service is designed to protect the health of the troops assigned to the command and help preserve the financial interest of the government. To accomplish this task the base veterinary service is organized in the following major areas of activity: Administration, receipt and surveillance, laboratory and food sampling service, animal service, and food service facility inspection. The primary duties involve food inspection, care of government-owned sentry dogs, and participation as a member of the preventive medicine team with special emphasis on food-borne infections and zoonoses control.

Fig. 1. Class 8 (purchases by exchanges) inspection of lobster-like crustaceans found in waters off Okinawa.

Food Inspection Service

Class 4, 5, 7, 8, and 9 inspection are performed. All food items delivered on base must be from the Army Quartermaster or from local sources approved by the Army Veterinary Corps. A wide variety of locally produced vegetables are available in season. Locally procured lobster-like crustaceans (fig. 1) and oysters are available during most parts of the year. Vegetables and some canned food items from Japan are also utilized. Local beef is available for resale in the commissary and nonappropriated fund activities such as clubs and snack bars.

Fig. 2. Animals suspected of having ringworm are examined under ultraviolet light.

Milk of the recombined variety is used, and from it such items as cottage cheese, ice cream, and sherbet are manufactured.

Most food received on the base is already government property, so inspection attention is concerned with any insanitary or unsound conditions. Due to the high humidity of the area, proper food storage and temperature control are very important. Proper rotation of stored food items requires routine surveillance.

Sentry Dog Care

The base veterinarian is responsible for maintaining high health standards of assigned sentry dogs. Prompt treatment is given to any animal sick or injured, with the goal being to return dogs to guard duty with the shortest loss of time possible. Routine immunization for rabies is given, and constant attention is needed to prevent and control hookworm infection. The initial health examination and routine distemper and hepatitis immunizations are given dogs when procured for the Air Force and before training and assignment to the using organizations.

The major disease problem is heartworm infection. Semiannual blood examinations are made to determine infections in previously negative dogs. Two cubic centimeters of of blood is drawn from the radial vein and placed in 10 cc. of 2% formalin solution.

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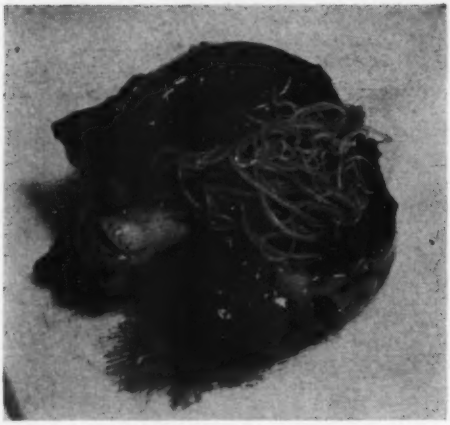

Fig. 3. Heartworms (*Dirofiloria immitis*) found in a pet from southern United States.

Samples are then examined by the Veterinary Laboratory of the 406th Medical General Laboratory, Tokyo, Japan. Unless contraindicated due to physical condition, new cases are treated with filarsen®[1] (dichlorophenarsine hydrochloride) administered intravenously at the rate of 3 mg. per kg. on three consecutive days. Since dichlorophenarsine is not a microfilaricide, caracide®[2] (1-diethylcarbamyl 4-methylpiperazine dihydrogen citrate) is administered 30 days later. A dosage of 10 mg. per lb. is given three times daily for 21-28 days.

Zoonoses control clinic for privately owned pets (figs. 2 and 3) is conducted at prescribed hours. Annual rabies vaccination of pets on base is required. Pets entering and leaving the base must be accompanied by a health certificate.

Preventive Medicine Activities

The base veterinarian serves on the base surgeon's preventive medicine team as an adviser on zoonoses control and prevention of foodborne infections. The base veterinarian also serves as an adviser to the surgeon on nutritional adequacy of the garrison ration and serves as a member of the rabies board when cases are considered for the Pasteur treatment. When necessary the base veterinarian, as a preventive medicine inspector, assists the medical officer in matters concerning insect and rodent control, and environmental sanitation.

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American Animal Hospital Association Announces 1957 Convention Plans

Plans are well underway for the 1957 annual meeting of the A.A.H.A. which will convene on May 8-11, 1957 at the Hotel Sheraton Palace, San Francisco, Calif. The facilities of the headquarters hotel and the promise of prominent program speakers should serve to attract a large number of those interested in practice with small animals.

President J. H. Yarborough, Miami, Fla., will preside. Dr. N. L. McBride, Jr., Pasadena, Calif. is chairman of program.

Those interested in receiving copy of the program when available should address Dr. Wayne Riser, 5335 Touhy Ave., Skokie, Ill., executive-secretary.

®[1]Lederle Laboratories Div., Am. Cyanamid Co., Pearl River, N. Y.

Fig. 4. Air Force sentry dogs with Okinawan handlers.

Business Decisions that Affect your Tax Return

This article is based on information supplied by the American Institute of Accountants, the national professional organization of certified public accountants, and checked for technical accuracy by the Internal Revenue Service.

Long-range tax planning in today's business world of high tax rates is no longer "big business foolishness." Last-minute tax worrying with no year-around tax thinking can result in the loss of sizeable savings for small and medium-sized businesses when it comes time to file a tax return.

For example, assume that last summer you were forced to replace your air conditioner. You shopped around and found you could either sell your old unit to a private party for $500., or a dealer in town would give you a trade-in allowance of $500. on it. That seemed like six-of-one-half-a-dozen-of-another to you; so without thinking — or worrying — about tax matters you traded in the old air conditioner.

To prove how a seemingly simple business decision such as this can affect how much tax you will have to pay, let's assume further that the air conditioner which you traded had originally cost $2500. and that you had taken $1000. in depreciation on it. This meant its cost for tax purposes was $1500., and you were going to "lose" $1000. whether you accepted the dealer's trade-in allowance or $500. or sold to the private party for $500.

So far still six-of-one-half-a-dozen-of-another, but now since you elected to trade-in your old air conditioner, let's see how you can claim a deduction on a tax return for your $1000. loss. The answer is simple. You can't. All you can do is add the amount of the loss to the cost of your new unit, and eventually receive tax credit for your loss in the form of slightly higher depreciation deductions.

On the other hand, if you had made a bona fide sale of your old unit to the private party and a separate purchase of a new unit from a dealer, you would have established a $1000. loss which could be claimed as a loss deduction on a tax return and used to offset regular income.

It is not always true, of course, that a loss deduction on the tax return is worth two in the bush of depreciation, but a general rule to consider when you are trying to decide whether it would be more advantageous taxwise for you to sell or trade-in an asset is: Sell "loss" property to obtain a deduction, and trade "profit" property to avoid the tax which must be paid on any profit realized from sale of an asset.

You may find that you have sold yourself into a capital gains tax or traded yourself out of a loss deduction if you have not figured your depreciated costs correctly. This is a matter you should discuss with a certified public accountant. Not only can he verify the accuracy of your mathematical computations, but he can also explain the advantages and disadvantages of the various methods used to compute depreciation. It could be that the method you used or are using is not the one most suited to your business needs from a tax standpoint.

Depreciation Option

For example, if you asked a CPA whether you should use the straight-line or declining balance method to depreciate your new air conditioner, one of the first questions he might ask you would be: What are your cash requirements and what are your profits likely to be? If you are thinking of expanding and need additional cash within the next few years, he might recommend that you use the "new" declining balance method to compute depreciation.

The declining balance method "speeds up" or increases depreciation rates. This starts the chain reaction to your objective of retaining cash in the business, because when you increase depreciation rates you also increase allowable depreciation deductions on your tax return. The amount you may write-off the first year is twice what it would be if you used the straight-line method; so by applying a $1000. instead of $500. depreciation deduction against your regular income, you are going to reduce your taxes, and cash that does not have to be paid out in federal taxes can be retained in the business for expansion purposes.

It seems all good things eventually come to an end, however, and while in the first year the declining balance depreciation rate may be double that of the straight-line, this differential diminishes in succeeding years until declining balance deductions are even less than they would be under the straight-line method. This is why it is important that you consider current and future earnings before you select a depreciation method.

For example, if your current earnings are low, or if you are putting in a new line of merchandise and the results of this expansion will take a few years to show in your earnings, it might be more advantageous taxwise for you

to use the straight-line method of computating depreciation.

The straight-line method does not "speed up" depreciation deductions. It spreads them out equally over the estimated useful life of the asset; so when you use a straight-line method you are saving, in a sense, for a rainy day. When your earnings improve or increase, you will have more substantial depreciation deductions to apply against those earnings. There usually is no point in increasing a loss or reducing low earnings by claiming depreciation deductions when you do not need them.

New or Used Equipment

A point to remember when you are trying to decide whether to buy new or used equipment is that second-hand equipment *must* be depreciated by the straight-line method. This tax factor should be considered, because loss of the opportunity to use the declining balance method with its rapid write-off feature may cancel any immediate savings effected by the purchase of used equipment.

Proprietorship-Partnership-Corporation

The matter may have been decided and forgotten many years ago, but a basic question veterinarians should consider from time to time — and one which has many tax implications — is whether to practice as a proprietorship, partnership, or corporation. There may be personal or professional factors that force the selection and maintenance of a noncorporate form of organization, but depending on the earnings of the practice and the amount of those earnings you may need to withdraw, there are certain tax advantages to be gained by incorporating a new or expanding company.

Since proprietorship and partnership income is taxed at individual rates, which range anywhere from 20 to 91%, and corporation earnings are taxed at corporate rates of 30% on the first $25,000. earned during the year and 52% on the excess, it might appear that if you have relatively low income the proprietorship-partnership rates are lower. However, you must also consider that the corporate tax carries with it the privilege of deducting a reasonable salary paid to an employee-owner. The employee-owner has to pay a personal tax on his salary, of course, but if he were not incorporated, he would have to pay a personal tax on all the money earned by the business.

If the retained earnings of the company are taxed at a corporate rate which is lower than what the personal tax rate would be, the employee-owner would benefit by having additional funds available in the corporation for expansion purposes. These funds may be accumulated in a corporation up to $60,000. without further tax penalties, and even higher if the corporation can prove a need for them.

These advantages — while they may cut your current tax bill and increase working capital for expansion needs — can be lost if you have jumped into a corporation without first reviewing your own long-range cash requirements. If you are continually forced to withdraw money from the corporate earnings to pay personal expenses, you will have to withdraw these funds in the form of dividends. That means the corporation will have to pay tax on the earnings you are withdrawing as dividends, and you will have to pay tax on the dividends received. The "double tax" on earnings and dividends can nullify any tax advantage from incorporation when earnings must be withdrawn immediately as dividends.

Many businessmen seek professional advice about tax matters as they do professional assistance with their golf game — when the slice has become almost unbearable. You can save tax dollars by realizing that business decisions made in the fall affect the amount of tax you must pay in the spring. Practice year-around tax thinking, seek qualified advice that your certified public accountant can give when you are in doubt as to the tax effect of even the most routine business decision.

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Nonspecific Diarrhea

(*Continued from page 29*)

could be traced to a failure of completely removing the initial causative agents. Approximately 9.3% of cases failed to respond to treatment.

Summary of results is not spectacular, but one must bear in mind that many of the patients had been chronically affected and lactinex therapy was used as a last resort measure.

2. No harmful effects or side-reactions were observed in any of the patients treated.

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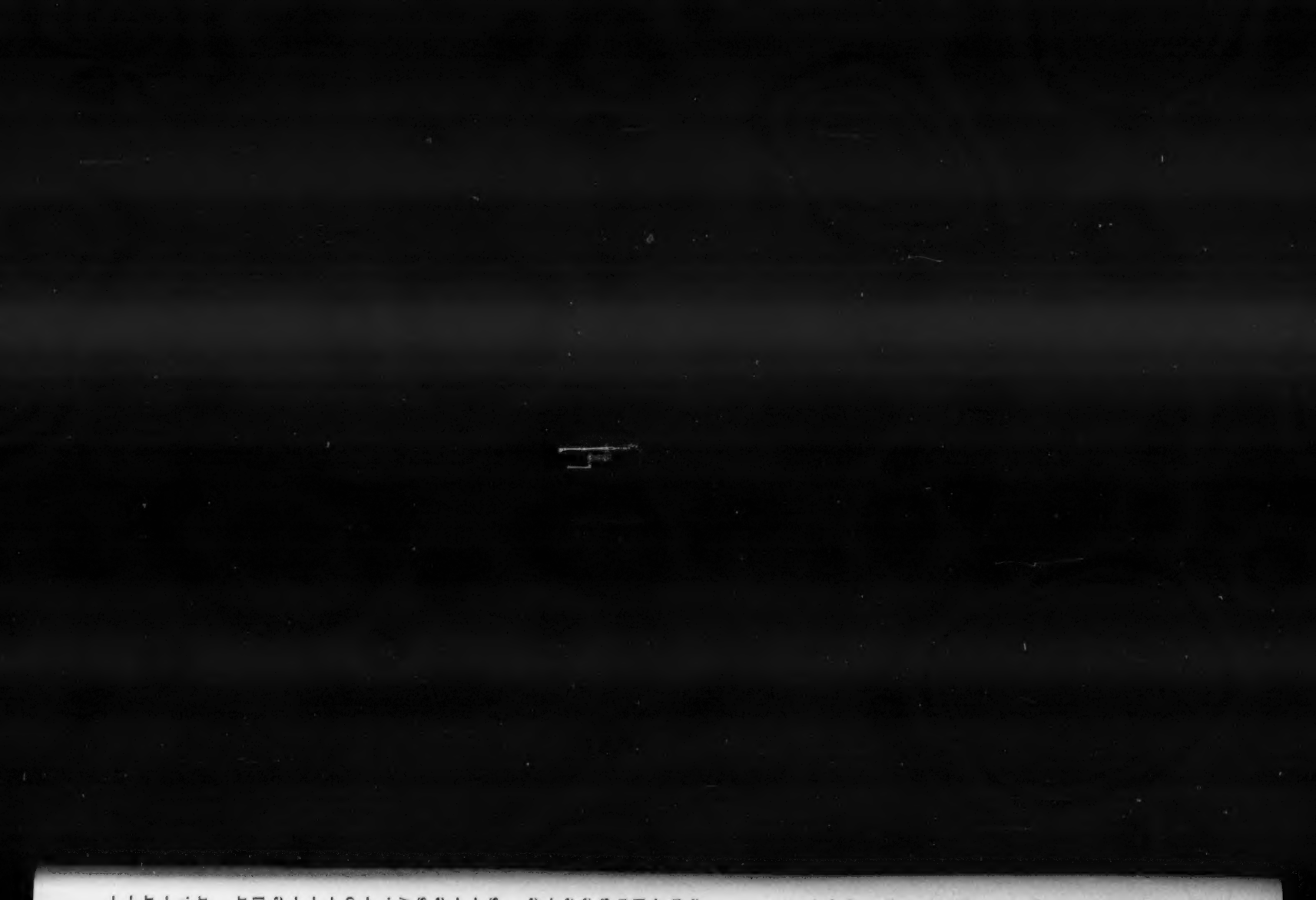

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Frothing, Surface Tensions And Viscosities Of Paunch Contents Associated With Changes From Alfalfa Hay To Fresh Legumes†

R. E. NICHOLS, D.V.M., M.Sc., Ph.D., D.V.Sc., KATHERINE PENN, B.A., and JOAN SCHREIBER, A.B., M.A., Madison, Wisconsin

THE experiences of many practicing veterinarians, livestockmen, and researchers indicate that excessive frothing of paunch contents is being recognized as the major consideration in legume pasture bloat. It is possible to demonstrate toxicity of fractions of legumes administered by technics which do not exactly represent the normal intake of the plant itself[1-4]. Considering the millions of tons of legumes that have been and are being fed, it is justifiably questionable whether in the absence of excessive paunch frothing there is evidence of any other consequential digestive difficulties accompanying the natural grazing of these plants by cattle.

It is doubtful that frothing can occur: (a) Without sufficient numbers of microorganisms being ready and able to produce the bubbles which constitute the froth, (b) without enough suitable and readily available food for the microorganisms to produce enough bubbles to constitute a froth, and (c) unless the physical characteristics of the food mass and the paunch fluid are conducive to the trapping of the bubbles, thus preventing them from coalescing into a free, eructatable mass of gas. That some of these physical characteristics are inherent in plant structure is obvious. That some may be the results of changes wrought by chemical and microbial digestion is probable.

Flooding of the cardia with water followed by increasing gas pressure in the paunch can block eructation[5]. The physical role of plant and paunch fluidity is in need of more exact definition. The role of fluidity of the paunch in relation to speed of microbial digestion also needs clarification. Frothing *per se* does not constitute an abnormal process in the digestive scheme of ruminants except when it proceeds in volume and speed beyond the anatomical and physiological limitations of eructation and of withstandable paunch pressures. This seems true regardless of the neural aspects of eructation, the motility of the organ, toxicity of extractions, et cetera.

Only gas is normally belched—not froth, liquids, or solids. A similar discrimination among gases, liquids, and solids seems to exist in belching in man also. Whether or not free gas is released following tapping of the rumen may be more of a coincidence than a criterion for classifying types of bloat[6]. It is probable that the amount of free gas present in the dorsal portion of the rumen at the time that excessive frothing reaches the stage of blocking the cardia, may vary considerably depending upon volume of rumen fill, rapidity of fill, the speed and degree of frothing, and the amount of free gas belched immediately before maximum frothing.

Increases in paunch frothing can be induced in animals with certain rations and regimens. Discomfort and considerable pressure within the paunch frequently can occur with the feeding of fresh young legumes or fine ground feed but seldom with grasses or hays[7]. During periods of increased frothing the animal stops eating until it feels more comfortable whereupon it continues to eat the same ration though more cautiously. Further extension of the frothing process can occur and can be dangerous to the life of the animal. It is doubtful that frothing can be extended to the danger point without a rapid microbial digestion of a large volume of readily available nutrient material. The frothing must be rapid enough to flood the cardia and to induce enough pressure to interfere with circulation of the paunch and with respiration of the animal.

With free choice as to variety and quantity of feeds as well as frequency of feeding, it is

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doubtful that normal animals would bloat, but few cows today have this much freedom. Even cows at pasture are often forced to eat plants of varieties, or stages of development which they would not choose to eat if other feeds were available. Their hunger satiation mechanism does not warn them that additional pressure from frothing can develop *after* they have eaten enough to feel seemingly satisfied. The more hungry, more voracious and less cautious animals usually are the first to bloat.

Observation of animals eating grasses and legumes leads one to surmise that periods of relative hunger seem to return more frequently when the animals are on young legume pasture. Whether they eat less at one time because of the absence of other types of forage or whether they have learned to be cautious of the plant during some stages of its growth is not known. Following these periods of low food intake some animals will eat more feed and eat it more rapidly simply because they become hungry. This results in a larger proportion of fresh unfermented feed in the paunch. If this feed is fresh legumes the fluid level of the paunch is raised not only by a larger quantity of bubbles but by a relatively greater quantity of fluid constituting the froth.

Cows always try to regulate frequency of eating and quantities consumed per eating period. More often today the convenience of the feeder is paramount, instead of what appears to be the cow's attempt to maintain a fairly uniform flow of nutrients. Apparently even a few hours without newly added feed will alter the physical characteristics of paunch ingesta. That periods of mild "starvation" occur frequently in cows on modern feeding regimens can be demonstrated by frequent examinations of samples of paunch contents, particularly from different levels of the organ. Numerous experiences have been related by animal husbandmen suggesting the correction of some digestive difficulties by simply giving the animals more freedom of choice of feeds and feeding times.

Materials and Methods

This experiment was designed principally to demonstrate a possible relationship between increases in paunch frothing, apparent surface tension (ST) and relative viscosity (V) of paunch fluid. It was hoped that measurement of these characteristics might serve as tools in further attempts to find the factors and events which produce the excessive increase in froth that accompanies legume bloat.

Two mature Jersey cows with rumen fistulas were stanchion-fed and repeatedly subjected to sudden changes from a good quality alfalfa hay to fresh ladino clover. Samples of paunch fluid were taken frequently. The ST of each sample was determined by a DuNuoy tensiometer, V by a Stormer viscosimeter. Paunch contents and samples were also examined visually for the relative amount of frothing present.

Results

Periods of increased and excessive frothing following changes from alfalfa hay to fresh ladino clover are associated with periods of high surface tension and viscosity (table 1).

There is evidence that consumption of approximately equal parts of fresh ladino clover and brome grass does not result in increased frothing.

For an hour or so following the changeover from hay to legumes, the fresh legumes are not on top of the paunch contents as hay usually is just after it has been fed. They are below what remains of the previously fed hay. This can be observed. Transient increases in V of middle samples on the same day also suggest such a position.

Frothing seems to start in the upper regions of the paunch and extends into the lower regions where it becomes increased in intensity.

Discussion

The position in the paunch of the initially fed fresh legumes following hay feeding supports the belief that legumes are more dense than hays or grasses and assume lower levels for digestion, a condition physically conducive to bubble formation and frothing in the lower paunch where gas escape is more difficult[7, 8].

The ST and V of the paunch fluid of cow 2 were high before feeding on May 18 (table 1). This animal had not been fed since the afternoon before. Approximately 22 lb. of first cutting crisp ladino clover tops were consumed in the first 15 minutes of eating (8:55-9:10 a.m.). This cow's abdomen became tense as she became uncomfortably full of frothy material which began to squeeze out around the fistula plug. She stopped eating, became uneasy, stamped, bellowed, and would not stand still in the stall. Expression was one of anxiety. Rumen motility was strong but respiration was difficult. When the cap was removed about 2 bushels of frothy ingesta were forced out by considerable pressure bringing rapid relief. Its viscosity was extremely

high, 3.403 (table 1). By 10:15 a.m. eating was resumed but at a much slower rate. By 2 p.m. the cow had consumed another 22 lb. The animal was then given an additional 40 lb. none of which was left in the manger by the following morning. The next morning's prefeeding sample was also high in ST and V. About 46 lb. of clover was fed which was consumed rapidly for the first 15 minutes, after which the cow's paunch contents became excessively frothy but not as extensively as the preceding day. The animal became uncomfortable, stopped eating, and gradually became more comfortable. By 2 p.m. the cow had finished the remainder of the feed offered and was given another 40 lb. Eating was started immediately before the five-hour sample was taken. All of this was consumed before the next morning. The ST and V of the next morning's prefeeding sample were still high. The cow was fed alfalfa hay. Frothing increased but not excessively for about an hour while she was eating the day, then diminished.

Several incidents similar to the above have occurred during this type of feeding regimen. All signs appear to be similar to those induced by artificial increases in rumen pressure and those observed in developing bloat. Although allowed to progress to the point of collapse once in each animal, neither was allowed to die. Release of froth pressure by removal of the cap of the plug brought immediate relief in the same manner as does the release of pressure from the rumen of animals with artificially induced increases in paunch pressure by overloading with water and insufflation with air[8].

In view of these experiences and the results of foam control by surface active agents, it is difficult for us to interpret the results of experimentally produced toxicities of extractives of legumes as evidence of a toxic cause of the frothy bloat which can result from actually feeding the unaltered, unextracted plant itself. It is felt that the mechanisms of paunch digestion in ruminants are not adaptable to large quantities of fine-ground feed or to legumes which in the young, leafy stage appear to digest more like concentrates than like roughages. It is also contended that more attention to the true roughage requirements of ruminant digestive processes will reduce losses from bloat both in the feedlot and in the pasture.

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(Continued on page 42)

TABLE 1. Frothing, Surface Tensions (Dynes) and Viscosities of Ventral Paunch Contents Associated With Sudden Changes From Alfalfa Hay to Fresh Ladino Clover

		May 16		May 17		May 18		May 19		May 20	
Date	Cow	Alfalfa Hay		Fresh Young Ladino		Fresh Young Ladino		Fresh Young Ladino		Alfalfa Hay	
Feed	No.	ST	Vis	ST	Vis	ST	Vis	ST	Vis	ST	Vis
Before	1	55.4	1.139	57.0	1.153	56.6	1.194	55.8	2.028	59.2	1.458
Feeding	2	57.2	1.125	55.2	1.166	56.0	1.576	60.3	1.986	56.2	1.555
15 min. After	1	55.6	1.139	58.2	1.118	59.4	1.157	62.9	1.662	60.2	1.265
Feeding	2	52.7	1.132	55.3	1.132	57.1	3.403	61.9	1.944	56.7	1.736
30 min. After	1	52.5	1.153	58.9	1.139	60.1	1.153	62.4	1.284	56.2	1.368
Feeding	2	54.0	1.097	55.5		60.3	1.666	62.7	1.437	57.4	1.611
1 hour After	1	52.5	1.139	61.6	1.111	61.4	1.139	59.4	1.141	61.2	1.222
Feeding	2	52.7	1.083	58.0	1.125	61.9	1.194	60.9	1.309	56.9	1.743
2 hours After	1	54.1	1.111	59.0	1.153	59.1	1.222	59.2	1.272	57.2	1.201
Feeding	2	54.0	1.111	61.4	1.097	60.9	1.208	58.1	1.253	52.1	1.486
5 hours after	1		1.097	57.1	1.125	61.9	1.208	y62.4	1.669	55.6	1.153
Feeding	2		1.097	59.6	1.194	63.9	1.264	y62.4	1.606	54.4	1.222
FROTHING	1	Normal		Normal		Normal		Increased		Slight	
	2	Normal		Normal		Excessive		Increased		Increased	

y=Started 2nd feeding period before 5-hour sample.

Disinfectant Poisoning In Chicks†

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COAL-TAR products, which are effective and economical disinfectants and insecticides, may at times prove potentially poisonous for poultry[1, 2, 3]. These disinfectants, even when employed in recommended concentrations and when no detectable odors remain in the house, may leave sufficient residual quantities which may be present to be volatilized by brooder heating equipment and possibly by body heat of the chicks to cause morbidity and mortality. An excellent description of this condition was published in 1944 by Bullis and Van Roekel[3].

The potential toxicity of coal-tar products may have been overlooked, sickness and losses resulting attributed to other causes or instances of poisoning so infrequent that other cases have not been reported. Five cases of coal-tar product poisoning in chicks were diagnosed in four months (March to June 1955). Coal-tar products or wood preservative was suspected to be the cause of losses in another instance. Our findings are comparable to those of the report cited[3].

History

Symptoms induced in chicks by coal-tar products and infectious agents are similar. Infectious bronchitis and Newcastle disease are frequently incriminated because of respiratory involvement and prevalence of these infectious diseases. Information obtainable relative to the disease may be sketchy and the cause of the sickness and losses may not be suspected until suggestive lesions are observed. Further questioning usually verifies the use of coal-tar product. Chicks were from three to six weeks of age when submitted for diagnosis (three weeks, three cases; four weeks, two cases; and six weeks, one case).

Minimal losses reported during the first weeks were probably due to other causes. Losses which can be attributed to coal-tar poisoning occur in 10 to 14 days after exposure. Sickness, characterized by respiratory symptoms, may appear suddenly or respiratory involvement may be preceded a few days by depression, weakness, and huddling. Losses reported at the time of examination were: 78 of 273 in six days, 6 of 250 in three days; 15 of 259 in two weeks; and, 100 of 2000 in four days. The total losses in these cases were not available. In the last case listed, chicks were battery raised for the first three weeks. Losses started the third day after the chicks were removed from the batteries. The batteries were located in the same room used for brooding.

Two chicks presented lesions of pullorum disease and *Salmonella pullorum* was recovered from them. Lesions in all chicks were quite suggestive of coal-tar poisoning. Creosote or wood preservative products, to the best of the owner's knowledge, had not been used. The number of chicks reported to be affected varied. Affected chicks may prefer to remain indoors even in warm weather. The feed consumption is usually reported to be normal or only slightly reduced. Irregular and retarded growth and ragged feathering are common complaints by the owners.

Symptoms

Respiratory symptoms were conspicuous in four of the five cases. Severely affected chicks exhibited marked dyspnea by open mouth breathing with extension of the head and neck. Gurgling sounds accompanied respiratory movements. Gasping and wheezing were noticeable in less severely affected chicks. The chicks were depressed, weak, and their feathers ruffled. They huddled together as if cold, even in a warm room. Subcutaneous edema of the abdominal region was obvious in some chicks without handling while it was detected in others only by palpation. The former waddled or walked stiff-legged. The skin of the mandibular and upper cervical region was devoid of feathers, thickened, and scaly in the older group of chicks.

Tissue Changes

The subcutis of the abdominal, thigh, thoracic, and posterior cervical regions were infiltrated with variable quantities of yellowish fluid, which, in some cases, contained small or larger masses of coagulated or gelatinous material. The skeletal muscles were pale, the

†Contribution no. 153, Department of Veterinary Medicine, Agri. Exp. Sta., Kansas State College.

blood vessels injected and frequently studded with small linear hemorrhages. The carcasses were well developed and in good or moderately good condition except in the chicks six weeks of age. The body cavities and the air sacs contained variable quantities of straw-colored or colorless fluid.

Frequently small or larger coagulated masses were suspended in the fluid or loosely attached to the tissues. The air sac membranes were usually thin and transparent but less frequently were slightly thickened and focally cloudy. No exudate was observed. Grayish fibrinous sheets were loosely attached to the surface of the liver of a few of the severely affected chicks. The liver was pale reddish-gray or mottled. Small ecchymotic subcapsular hemorrhages were observed in some of the chicks. The capsule of the liver was thickened, the surface irregular and, at times, pitted. The size of the liver was variable, in some cases moderately to markedly enlarged with accentuated rounded borders while in others marked atrophy had occurred. The livers offered greater resistance to sectioning. The gall bladder was distended with bile.

The heart was moderately to markedly hypertrophied and the myocardium pale or mottled. The coronary vessels were injected. The pericardium was distended with clear or yellowish fluid. The spleen was pale or mottled and atrophic. The lungs were rubbery in consistency and markedly edematous. A clear or yellowish, at times slightly sanguineous, fluid oozed on sectioning. Grayish areas of pneumonia were occasionally present. The tracheal and bronchial lumina contained a clear frothy fluid and mucus. The mucosal surfaces were not inflammed or only slightly so. The serosal surface of the intestines was pale, and the blood vessels were injected. A mild catarrhal enteritis was observed consistently.

Areas of hyperemia and small ecchymotic hemorrhages were sparcely scattered throughout the thickened mucosa. The crop, gizzard, and intestines contained variable quantities of ingesta. *Eimeria acervulina* infection of moderate degree complicated one case. The kidneys were markedly enlarged, grayish, or mottled and extensively degenerated. The lobulations were distinct. The tubules and ureters contained increased quantities of urates. The bone marrow was pale and the fluid content increased. The odor of coal-tar was detected in the internal tissues of three cases.

Treatment

Effective medicinals are not available. If possible, chicks should be moved immediately to a clean house and if the weather permits, should remain outside during the day. Ample ventilation is essential. The majority of chicks continue to eat and, if the damage is slight, complete recovery usually occurs. Some chicks, moderately or more severely affected, may survive but their value is questionable. Most chicks affected to this degree succumb. If other facilities are not available, thorough cleaning of the contaminated house and liberal use of clean litter may be satisfactory. Maximum permissible ventilation must be provided. Bullis and Van Roekel[2] state that under certain conditions buildings treated with coal-tar products five weeks before use may still be dangerous. In cold humid weather houses must be prepared several weeks in advance and thoroughly ventilated before use. Operating the heating equipment several days before arrival of the chicks may prevent poisoning.

Discussion

Morbidity and mortality probably depend upon several factors, *e.g.*, the concentration of the toxic agent, the number of consecutive years the product has been used, overcrowding, type of floor, quantity of litter, prevailing weather conditions, and ventilation. Porous types of flooring material that absorb the disinfectant are more dangerous than impervious flooring. In one instance a coal-tar product had been satisfactorily used four years previously without ill effects; losses occurred the fifth year. Losses reported by Bullis and Van Roekel[2] were from 10 to 15% in some cases. Losses herein reported were from 2.4 to 56.6% (2.4, 5.0, 5.8, 7.5, 28.5, and 50 to 56.6%). These figures do not represent the total loss which undoubtedly was greater.

Symptoms of moderate to severe respiratory embarrassment, resembling those induced by the infectious respiratory diseases, usually develop in this form of intoxication. Careful questioning of owners reveals some differences in the development of the diseases. The feed intake is less seriously affected, the rate of spread is relatively slow and a smaller number are affected in coal-tar poisoning than in infectious diseases.

Tissue changes are quite characteristic, although salt poisoning[3, 5] and vitamin E deficiency (alimentary exudative diathesis)[3, 4] cause similar lesions. Diarrhea may occur in salt poisoning and probably a larger proportion of chicks are affected.

The individual susceptibility of human beings to poisoning by phenolic or creosote compounds is subject to marked variation. The susceptibility in chicks also appears to vary markedly. In some cases only a few chicks are affected, while the majority appear normal.

The mechanism of poisoning in chicks was not determined by Bullis and Van Roekel[2]. Naturally occurring and experimentally produced poisoning were identical. Poisoning may occur by inhalation or by absorption through the skin in human beings[6]. Absorption in chicks may be by similar routes. Widespread capillary injury with edema of the lungs, kidneys, liver, pancreas, and spleen characterizes fatal intoxication in man. The central nervous system is primarily and seriously affected[6]. The only sign referrable to nervous system involvement in chicks was drowsiness. Mydriasis, which occurs in man[6], was not observed in affected chicks. The extensive transudation observed in affected chicks indicates severe vascular damage.

Chicks mildly or moderately affected may survive and completely recover. Tissue changes in mild cases may possibly be reversible, as reported in salt poisoning[5]. One flock in which severe poisoning occurred last spring is now in excellent production. "Several" chicks died after they were moved to clean quarters. More extensively affected chicks, with marked changes in the vital organs, could survive but their value would be doubtful. Changes observed in some organs appear to depend upon the length of exposure to and/or the concentration of the toxic agent[3]. Early hepatic changes are manifested by marked enlargement while extreme atrophy is observed after prolonged exposures.

Summary

Coal-tar products are capable of causing morbidity and mortality in chicks. No reference to the effects of these agents upon adult fowl has been observed. Respiratory symptoms, similar to those produced by infectious agents, usually develop. The disease is characterized by anasarca, ascites, cirrhosis, cardiac hypertrophy, hydropericardium, and nephrosis. Coal-tar products may be used for several consecutive years before toxic effects appear. Sufficient quantities of the product may be present to cause toxic reaction even though odors can not be detected. Individual susceptibility is marked.

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Whey Test for Brucellosis

We are in receipt of a communication in which we are asked again to comment about the whey bovine brucellosis test. The first step is to obtain a composite sample of milk from all four quarters — 10 ml. is sufficient. Two drops of rennet are added to the milk specimen, and this is incubated for approximately one hour at 37 C., or until the whey has clearly separated. The antigen used is the same as that used in A.B.R. (Abortus Bang Ring) test. Following these preliminary steps the test is completed in the method of the blood serum plate test. A comparison of this test with the usual blood test is a complete agreement of the two, and the whey test is positive when the blood test is doubtful. Another very important point in favor of the whey test is that a whey titer does not persist in vaccinated animals, unless this happens to be a recently vaccinated adult animal, and even these latter are said to become negative in approximately three months. Some practitioners now suggest first the A.B.R. test; if there are reactors, then subject individual animals to the test, and all dry cows to the usual blood test.—*R. R. Dykstra, D.V.M.*

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Frothing of Paunch Contents

(Continued from page 39)

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EDITORIAL COMMENTS

Review of Progress in Veterinary Medicine—1956

VETERINARY Medicine continues to broaden its scope and to increase its value in modern society. The bright star of public recognition of its true value is rising slowly but surely. Matters concerning the contributions of veterinary medicine to the welfare of the national community have begun to be appreciated and now reverberate in the lecture hall, the press, and in radio and television presentation. This is among the most important sequences of events having veterinary interest during 1956.

The year just concluded marked the 50th Anniversary of the Meat Inspection Act. To properly commemorate the event, promotional units of the U. S. Department of Agriculture prepared material which was widely used and which assured Mr. and Mrs. America that the meat and meat food products they eat were produced under guarantees as firm as veterinary science could devise. Illustrative material emphasized that professional men—veterinarians—whose senses are trained to cull out abnormals are stationed on the floor where animals are slaughtered, and with sleeves rolled up actually examine glands, vital organs, and other animal tissues where disease processes most likely will be found. That others were devoted to laboratory tasks, long hours of microscopic search, testing to be sure that only wholesome and disease-free carcasses are offerred to the consumer. This is not to limit or overlook the value of inspection service to assure not particularly dangerous but noxious or unsanitary practices.

Expression in many other ways has aided to make the past year a memorable one for putting into action what veterinary medicine means. Many personalities have helped make this possible. The president of the national association, Brig. Gen. Wayne O. Kester, has also set an example for defining professional service in the light of its public benefit. A continued realistic relations program may be expected not only to give credit where credit is deserved but will most certainly stimulate the profession to greater effort and more precise performance.

Animal Disease Control

Emphasis continues to be placed on preventive veterinary medicine. Recognized is that salvage of animals after disease assault is neither in the interest of public health, nor profitable livestock culture. Federal and state governments continue to stress careful analysis and documentation of problems, research in ways and means of their solutions, and the application of every known device to prevent occurence or spread in event of an outbreak. Notable progress in this regard is evidenced in the opening of the fine facilities of the Plum Island Disease Laboratory, and the advancement of plans for the establishment of research facilities and an organization in Iowa. Example of state activities is the progress and development of the Florida Diagnostic Laboratories and similar facilities elsewhere. Huge expenditure for this work is more than balanced by savings effected for livestock growers aside from assurance that any possible disease attack will be met by formidable defenses.

Disease Situation

The United States is still a relatively safe place to raise livestock. Reactors to the intradermal tuberculin test among cattle is less than 0.15% of those tested. This does by no means state the percentage of infection. It is known to be much less. Tested were selected herds for reaccreditation, where infection has been revealed, or on clues that suggest the presence of tuberculosis. Figures are actual.

Progress on the accelerated brucellosis eradication campaign has exceeded expectations of those who sponsored it. Federal appropriations have kept pace with testing and calf vaccination. Two states were added to the list of modified accredited free areas for brucellosis in 1956; Washington and Wisconsin. Counties in a number of additional states are being added as the work of veterinary practitioners, who are drawing blood samples and vaccinating calves, progresses. The goal of national modified accredited status for brucellosis is now set for 1960.

Brucella infection in swine is a sobering feature of the eradication program. The disease is known to be transmissible between species so that a hazard exists wherever hogs are bred and raised on the same farm where cattle are under a Plan A contract. Development of disease resistance is not enough to guarantee against infection that may be present in swine. Some further consideration must be given the problem of this disease in hogs and efforts made to dilute infection soon, else the minimum reducible limit in cattle will not be possible.

The situation as regards vesicular diseases is more stable now than for any period during the past ten years. Vesicular exanthema is practically nonexistent, foot-and-mouth disease does not exist in North America; Mexico has remained free since embargo was lifted two years ago. Vesicular stomatitis has presented some locally serious problems.

Mastitis in dairy cows, still listed as the number one disease of this class of livestock is not under control generally. An examination of present concepts regarding this disease and a procedure for control should be a national organization project. The profession needs to settle difference in regards to prevention and control, after which a recommended plan may be presented as expression of united opinion on the subject.

A review would reveal progress in a long list of disease of domestic animals. Such a list would include anaplasmosis, rabies, leptospirosis, infectious bovine rhinotracheitis, mucosal disease, enterotoxemia in calves, atrophic rhinitis in swine, and others. Limitations of space allow only mention that in these and other anamolies research is continuous and reports of this work and clinical experiences appear regularly in this and other publications.

Newsworthy among starts for 1956 is initiation of a national animal morbidity and mortality report prepared by the Special Diseases Branch, Agricultural Research Service. Assuredly as information is accumulated, clues to prevention and control will be revealed. The monthly report deserves the support of every veterinarian regardless of his specific activities.

Staunch Allies

Among the staunch supporters of improved professional service are the activities of manufacturers that supply drug and equipment items. These efficient organizations contribute not only to knowledge of pathological processes but exhaustively examine the possibility for treatment and control agents; which after tests and proof, are placed in the hands of practitioners. Expenditures for research conducted at plants and grants for supporting work at many institutions are also given unselfishly. One need only recall the crude products, packaged without consideration of convenience, that were sold for preparation of formulae within the memory of many practitioners. The offerings today have advantages made possible by progressive action and diligent application to the practitioner's problems.

The hard realities of a devastating drought in the Midwest during 1956 affected practice and income of practitioners in proportion to its severity in specific regions. On a whole, however, the profession has been able to busy itself in useful service and to improve its relations with allied professional groups and the public. Hope is taken for the new year.

There is no dearth of challenges.

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The Vital Role of Ruminant Organisms

Unless the rumen of feed-lot steers is populated with a bacterial flora of the type and species known to be most effective in converting rations into assimilable nutrients, only mediocre results at best can be expected from feed additives, according to Dr. John W. Cunkelman, veterinarian, Swift & Co., Chicago, in an address before the Animal Nutrition School, University of Wisconsin, Madison.

Since fermentation is a bacterial phenomenon and since bacterial organisms are susceptible to stress factors, it follows that marked changes in efficiency of feed utilization will occur as stress factors interfere with bacterial metabolism and the fermentation process. Stress factors mentioned by Doctor Cunkelman include artificial rearing of calves, drastic environmental change, radical changes in rations, and febrile diseases. He cited favorable experimental results following the supply of dried rumen contents to cattle in which significant gains were recorded over control lots.

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An epidemiological report was presented at the American Public Health Association dealing with a food poisoning outbreak due to *Salmonella blockley*, which may have affected thousands of persons. Commercially produced chicken salad was the vehicle of infection possibly introduced by employees of the manufacturers.

Salary of Student Assistants and Newly Graduated Veterinarians

A spirited discussion at the breakfast session of the Regional American Animal Hospital Association at Burlington recently, followed the invitation of chairman Wayne Riser for comments on suitable salary rates for student assistants during summer vacation periods and newly graduated veterinarians.

Considerable difference of opinion was held by members present. Some expressed the feeling that students were overpricing their services as were new graduates in some instances. These felt the inexperienced were receiving instruction of value far above the value of the services they rendered. Others took an opposite stand and expressed strong conviction that student assistants should get salaries equivalent or above highest paid kennelmen in addition to provision for suitable quarters. These also expressed the opinion to the effect that new graduates were finished products of an improved educational system and that rewards for these should include not only a generous salary but participation in the earnings of the practice up to the allowable limits percentagewise of gross income.

There appeared to be little standardization such as is rather general relating to compensation for medical externes and internes.

The question appears to be of such interest that some debate on the subject promises to be helpful from both the standpoint of practitioners and student or new graduate. Some delineation in consideration of duties to be performed and some range of compensation might be desirable and assist in strengthening cooperative effort of all concerned including professors at veterinary schools who have major influence on students in this matter as well as many others.

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Ringworm in Cattle

As a practical suggestion for handling ringworm in cattle, lift the solid or substantial crust if present, from the underlying surface which will bring with it most of the *Trichophyton verrucosum* (the etiological agent) as well as the infective hairs from their follicles. A relatively clean area will result that usually clears up after a single application of tincture of iodine, or Lugol's solution of iodine.

Hypertrophic Pulmonary Osteoarthropathy

The finding of a case of hypertrophic pulmonary canine osteoarthropathy at the Veterinary Clinic at Kansas State College recently was of interest. While this pathological curiosity had not previously been observed here at Kansas, the condition had been reported from time to time by several observers. The condition is characterized by bilateral deformity of the long bones which consist of bony exostoses formed by laying down of irregular excess bone beneath the elevated periosteum and the cortex of the affected bones. There is swelling of the subcutaneous tissues and thickening of the joint capsules with consequent stiffness of the joints.

A number of writers report a variety of pulmonary lesions associated with the osteoarthropathy. The Kansas case was a female German Shepherd said to be five years of age. There was much inflammatory exudate in the pleural cavity and a highly cellular fibrosarcoma of the parietal and visceral pleura which appeared to be confined to the thoracic cavity. Other writers have observed the same lesions as well as metastasis of a tumor of the prostate, an adenocarcinoma of the perianal gland, a metastasis from the mammary gland, a bronchiogenic giant cell tumor and even tuberculosis. The pathogenesis of this excess bony growth affecting the long bones in these dogs seems to be related to the pulmonary lesions interfering with the circulation in the lungs.—*L. M. Roderick, D.V.M., Department of Pathology, School of Veterinary Medicine, Kansas State College, Manhattan.*

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Erratum

The editors apologize to both the authors and readers of the feature article concerned with experiments in adding phenothiazine to ration of calves in Missouri experiments for error in proper titling. (See VETERINARY MEDICINE, Dec. 1956, page 551.)

The title of the article should have read, Some Results of Feeding Phenothiazine as a Means of Controlling Gastrointestinal Parasites of Calves. Experimental work reported in this comprehensive and detail report related to administration of the widely used anthelmintic at stated levels in the rations over specific periods.

PRINCIPLES OF ANIMAL HEALTH

R. R. DYKSTRA, D.V.M.
Manhattan, Kansas

Debridement of Fresh Wounds

During the summer of 1917 we attended an A.V.M.A. clinic in Kansas City, Mo. It was conducted in the Kansas City Veterinary College amphitheatre. At that time we were impressed when the late Dr. L. A. Merillat informally advised those in attendance that freshly created soft tissue wounds such as wire cuts in large animals—the wound having existed not more than 12 to 24 hours, should as a first step be submitted to debridement. Doctor Merillat spoke of the technic as "uncarpeting" which he demonstrated on one of the clinic patients. The procedure included cleaning and shaving the area then surgical removal of all foreign material and devitalized tissue. Healing by first intention was thus advanced but not assured.

Dr. W. F. Guard, Professor of Surgery at the College of Veterinary Medicine, Ohio State University, in an article appearing in the *Iowa Veterinarian* (Sept.-Oct. 1956) entitled, Rural Surgery, also recommends debridement of recent wounds to be followed by proper wound handling. In his article Doctor Guard emphasizes that antibiotics and sulfonamides may be administered systemically to prevent "invasive" infections but they "will not prevent the septic decomposition of dead and devitalized tissue in a wound and "will not neutralize the necrotizing enzymes in undrained pus. They can not be used as a substitute for thorough debridement of the wound of an open fracture," or of any other open recent wound.

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Sterilization of Milk

Cold sterilization of milk by subjecting it to "high-speed" electrons is claimed to destroy all organisms in milk so that it may be kept for many weeks, at room temperatures, without spoiling. In the usual high temperature sterilization of milk only the disease producing bacteria are destroyed, the souring organisms are not affected. High temperature sterilization has also been accused of causing "off" flavors in milk so treated. The use of high-speed electrons is said to be a much less expensive sterilization process than the high temperature method.

Spayed Heifers

During the Spring Conference of Feeder's Day at Kansas State College, among other items of interest was that concerning feeding spayed and entire heifers, with and without diethylstilbestrol. Daily gains (lb.) were reported as follows: Spayed 1.43; spayed plus diethylstilbestrol 1.62; non-spayed 1.74; non-spayed plus diethylstilbestrol 1.73 The ration consisted of sorghum silage, 1 lb. soybean oil meal, and 3.8 lb. of milo grain per head per day. However, it was also reported that when older heavier cattle received daily 10 mg. of diethylstilbestrol in the feed there were increased gains and lowered feed costs. Calves on high roughage rations in the dry foodlot or on grass did not respond as well as the older cattle on a fattening ration. Cooking data indicated that diethylstilbestrol in the ration had no harmful effect on the meat.

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Dwarfism a Challenging Problem

The "dwarf" problem in beef herds appears to be far from being settled or even near solution. Probably the most extensive research is being carried on by the University of California at Davis. Solution of the matter has not been made easier by the fact that there are several kinds of dwarfs, carrier cows, and carrier bulls. The condition is doubtless hereditary due to "one major dwarf-producing gene—plus modifiers" as so aptly stated by Gregory of the California staff. More than half of the dwarfs appear normal for size at birth so that they are difficult to detect at this age. Various tests for detecting dwarfism at an early age or carriers at a later age are in a measure helpful but certainly they are not conclusive. The tests used include the profilometer, the nucleic acid test, insulin injections test, and early fusion (about 5½ months as compared with a normal period of two to three years) of the sphenoid and occipital bones at the base of the cranial cavity. Veterinary practitioners are consulted relating to the problem at the time of parturition since delivery usually must be effected by cesarian section, or by embryotomy. Many dwarfs delivered normally die when nursing is discontinued as they have difficulty in foraging. Rumen tympany is common.

VETERINARY NUTRITION

MORRIS ERDHEIM, D.V.M.
Chicago, Illinois

Enzymes for Baby Pigs

A number of articles in the popular farm press have stimulated interest in the feeding of enzymes to baby pigs. The basis for these is the work done by Catron *et al.* at the Iowa State College.

These workers found that amylase and pepsin are found in the baby pig's stomach in small amounts. These gradually increase until the pig is five weeks of age when the curve levels.

This means that baby pigs can not use vegetable protein in prestarter and starter feeds until they are five weeks of age.

It has been established that baby pigs can digest milk protein at this early age. Indeed this is as nature intended it to be.

As a result, prestarter and starter feeds designed to be fed to the very young pig were designed around the use of milk products as the source of protein. This is particularly important in programs which advise the early weaning of pigs — three weeks or earlier.

Catron and his group found that the addition of 5 lb. of a 1-3000 pepsin product per ton of feed, helped the baby pig digest and utilize protein from vegetable sources (soybean oil meal).

Feeding these early weaned pigs a prestarter feed containing pepsin and soybean oil meal and no milk products resulted in a feed efficiency almost as good as that seen on a prestarter based on milk.

The practical application is obvious — milk is a much more expensive source of protein than soybean oil meal. The use of pepsin permits replacement with the less expensive vegetable protein.

Th Iowa workers also point out that the results with the pepsin are indirectly proportional to the degree of cleanliness in the hog house. Where the sanitation is poor and the disease level relatively high, pepsin seems to work more efficiently than under sanitary conditions.

Yet to be determined is the practical application to feeding programs which are not based on early weaning. These pigs do get milk from their dams. The use of pepsin under such conditions may not be economically sound. The use of pepsin is not indicated, apparently, in feeds to be fed pigs older than five weeks.

This whole subject is of great interest. It seems to open a door on something that has attracted attention from time to time — the use of predigested feeds for animals. It also suggests that more work will be done on the effect of feed additives, like antibiotics, on enzyme production *in vivo*.

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The Big Drought

Those of us from outside the state who attended the A.V.M.A. Convention in San Antonio, and witnessed some rain, might not appreciate the severity of the drought which gripped Texas and the southwest for the past few years. The obvious damage is usually the center of discussion on this subject. The subtle, less obvious damage, is extremely costly even if it goes unnoticed.

Nutritional deficiency is in this category. This is more often than not subclinical in manifestation. The appearance of the cattle is relatively "less good" than expected, but not too obviously bad.

The drought emphasizes the need for additional nutrients to be supplied to cattle. Foremost is the need for vitamin A.

Cattle are relatively poor converters of carotene to vitamin A. Where forage is abundant, this presents no problem because the carotene is there to waste. Under drought conditions, vitamin A must be added to the feeding program.

Vitamin A is relatively unstable in its natural sources. A number of methods are now being used to increase its stability. They include the use of antioxidants and coating materials of various types. In any case, the veterinarian has available to him vitamin mixes containing these "stabilized" vitamin A products.

It makes sense to urge cattle owning clients in drought areas to supplement feeding with adequate levels of vitamin A. This is inexpensive insurance against losses from premature births, abortions, blindness, and respiratory difficulties.

POULTRY PRACTICE PROBLEMS

W. R. HINSHAW, D.V.M., Ph.D.
Frederick, Maryland

Parthenogenesis Stimulated by Fowl Pox Vaccination

Parthenogenesis in turkeys and chickens has been under study at the USDA Research Center at Beltsville, Maryland since 1953. Progress on the results reported have been summarized in previous issues of VETERINARY MEDICINE (49:258; 50:45; and 51:504). A new and interesting observation by Dr. M. W. Olsen is that in certain breeds of chickens and in turkeys this phenomenon is apparently stimulated by vaccination with fowl pox vaccine (*Science*, 124:1078, [Nov. 30], 1956).

Since the beginning of the USDA research on this subject 13,000 infertile chicken eggs laid by four different breeds, New Hampshires, Barred Rocks, Rhode Island Reds, and Dark Cornish, and two crosses involving New Hampshires and Dark Cornish have been examined. The eggs of the Dark Cornish and Cornish crosses were the only ones that showed appreciable parthenogenesis that could be detected macroscopically. The data indicated that two factors influenced the initiation of parthenogenesis in Dark Cornish females studied. One of these was selective breeding, and the second, fowl pox virus. Pigeon pox virus seemed to have some stimulating effect, but not as marked as fowl pox virus.

In controlled experiments in 1955, more than three times as much parthenogenesis was encountered in eggs laid after fowl pox vaccination than in those laid prior to this time. In 1956, the difference was even greater when nine times as much parthenogenesis appeared in eggs laid after vaccination. In chicken eggs, Olsen apparently has not succeeded in getting parthenogenetic embryos to hatch as he has in case of turkey eggs (*Agric. Research*, 4:3 [June], 1956).

In 1956 trials with turkeys, Olsen also observed that fowl pox vaccination seems to stimulate initiation of parthenogenesis. A total of 3,100 turkey eggs were examined from two groups of turkeys. One group of 49 had been vaccinated at seven weeks of age and again at 30 weeks, and the other of 16 turkey hens from the same families were not vaccinated. A total of 180 (24.4%) of 738 eggs laid by the nonvaccinated group showed parthenogenetic development. The 49 vaccinated birds laid 2,362 and 750 or 31.8% of these showed parthenogenetic development. The records of these two groups indicated that the difference in parthenogenetic development between the vaccinated and nonvaccinated was significantly higher for the vaccinated group and that the difference was evident in each of three categories listed; membranes, blood formation, and embryo. It is of interest that in the vaccinated group, 102 eggs contained well formed embryos (18.6%) and in the unvaccinated 19 (10.6%) embryos were well developed at the end of the nine- or ten-day period of incubation observation.

Olsen states that it is not known at present whether the fowl pox virus is the sole agent responsible for the stimulation of parthenogenesis, or whether some contaminant in the vaccines used may be responsible. Neither is it known, according to him, whether the effect is a direct or an indirect one. He summarizes his results by stating that they indicate that some agent possibly of a physiological nature has a part in initiating parthenogenesis. It would appear that at least two conditions are necessary before an advanced type of parthenogenesis occurs. One of these is a genetically susceptible strain of birds and the other is that an activating agent must be present in the blood stream. Doctor Olsen has reported on a most interesting observation which no doubt will stimulate additional research in attempts to clarify this phenomenon.

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Inability to perch, laying on cage floor, even convulsions may signal various extremes of vitamin-mineral deficiency in canaries and other small caged birds. Zymatinic drops (Upjohn) is recommended therapy in such cases.—*Alan Bachrach, D.V.M.*

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Intercontinental airplanes carrying livestock outrun incubation periods of many diseases.

BOOK REVIEWS

Books reviewed in this department and any other books, if available, may be obtained by remitting the published price to the Book Department, Veterinary Medicine, Suite 803 Livestock Exchange Building, Kansas City 2, Missouri.

VETERINARY OBSTETRICS AND GENITAL DISEASES, by *Dr. S. J. Roberts.* 551 pages, 11 tables, 37 illustrations. Published by the author, Ithaca, New York. Distributed by Edwards Brothers, Inc., Ann Arbor, Michigan—Price, $10.50.

For a number of years veterinarians have needed a complete up-to-date textbook on obstetrics and the diseases of reproduction. Doctor Roberts' Veterinary Obstetrics and Genital Diseases fills the void of this neglected field. It is truly an outstanding book, by far the best and most complete on this subject available today. Doctor Roberts deserves sincere congratulations for its publication.

Definitive compilation of material for this type of book is a tremendous undertaking. Few are as well qualified or as well acquainted with the developments in this speciality as the author, and few could attack with alacrity a task that demands such a staggering sacrifice of time.

Useful information already published in such outstanding books as those prepared by the late Dr. W. L. Williams and others provided a frame of reference and background for this work. New experiences, developments, and technics have in some instances altered previous concepts beside adding to further understanding of the science. To satisfy the needs of the profession it was necessary to bring new information published in current literature and unpublished findings together into one book. Doctor Roberts has accomplished this. Each chapter, of which there are 19, is concluded with a well documented and comprehensive list of references.

Doctor Roberts states, "The author has purposely not tried to simplify, eliminate material, or omit any phase of the subject that concerns itself with veterinary obstetrics or genital diseases of domestic animals." He has been true to his word. Whenever a paucity of information precludes a definite conclusion, the author merely poses a question mark and provides the delicate framework of an outline that will someday be completed, altered or demolished as it is forced into the teeth of stubborn and irreducible facts.

The book was written primarily as a textbook for under-graduate veterinary students "and those practitioners who are still students." This includes all who are interested in building and furthering professional knowledge. The book will be invaluable to the practitioner even if it is used only as a convenient reference source. Genital diseases and obstetrical problems of all species of domestic animals treated by veterinarians are discussed.

The text will be particularly helpful to teachers. Their teaching responsibility has been simplified by the availability of this text. There will be no excuse for neglect or omission of material in the future.

The text is presented in a well cadenced style. Material is well organized and essentially errorless. Noticeable is that too few pictures and illustrations are used; there are only 37 in the entire book. The book is lithoprinted on good stock; thus cost has been held down. Had letter press printing technics with profuse illustrations been used cost of the work would have been doubled.—*F. H. Oberst, D.V.M.*

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BLAKISTON'S NEW GOULD MEDICAL DICTIONARY, edited by *Normand L. Hoerr, M.D.,* and *Arthur Osol, Ph. D.,* with the cooperation of an editorial board and 88 contributors. 1463 pages, 252 illustrations on 45 plates, 129 in color. 2nd edition, The Blakiston Division, McGraw-Hill Book Company, Inc., New York, N. Y., 1956.—Price $11.50.

Considering expansion in the field of medical science, the appearance of an up-to-date dictionary is timely.

The immediate predecessor of this new dictionary is the first edition of like name, but both have a long list of scholarly forerunners dating back to 1890.

The book is designed to serve as a modern comprehensive dictionary of terms used in all branches of medicine and allied sciences, including medical physics and chemistry, dentistry, pharmacy, nursing, veterinary medicine,

zoology, and botany, as well as medicolegal terms. Extended coverage has been given to veterinary medicine and dentistry and new words particularly of the science of biochemistry, organic medicinal chemistry, and nuclear science have been added. A useful new table, Radioactive and Other Isotopes Commonly used in Medicine, marks the modern character of the whole.

This reviewer has found the first and expects to find this edition convenient because of type selection and methods employed. Words to define are in boldface type and set in an overhanging indention to the left of the definition on a two- column page. This has made for ease and speed in finding words. Definitions are numbered when there are more than one distinct meaning or use. The most inclusive definition is presented first, followed by the more restricted meanings.

Nearly 120 pages are devoted to material selected by the editors as most conveniently handled in tabular form in the Appendix.

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A SHORT HISTORY OF VETERINARY MEDICINE IN AMERICA, by *Bert W. Bierer,* D.V.M., 113 pages. Michigan State University Press, East Lansing, publishers, 1955. Price—$3.

A veterinarian has complete and thorough knowledge of many subjects and is expected to stay within the bourne of his ken. This is clearly a matter of *noblesse oblige,* of "letting the shoemaker stick to his last." But a person wishing to learn the history of veterinary medicine has had no resources. Journal articles have been sporadic and often anecdotal; books in English have gone out of print and apparently out of the market. So the author has temporarily relinquished this *noblesse oblige,* if any, and offers his book as a child of necessity.

Embracing veterinary history over several hundred years, his objectives have apparently been: (1) To gather into a single volume the basic veterinary history of this country, (2) to describe this history in an interesting and romantic style, (3) to interpret past events in the light of present knowledge, and present knowledge in the light of past events, (4) to make as plain and familiar as possible the names and works of men who have contributed to the profession, (5) to lend appreciation to the veterinarian's calling, and (6) to kindle greater feelings of pride and responsibility toward the profession.

The preface states what we know to be so true; that we are grossly uninformed in our professional heritage . . . that many young graduates consider the beginnings of the profession contemporary with the date of their diplomas . . . that there has been no effective stimulus for the systematic study of veterinary history.

The book is divided into four sections: Out of the Ancient Past, Animal Plagues and Agricultural Progress, Disease Control Through Scientific Progress, and Medical Schools and Scientific Progress. The extensive bibliography, 229 references, is a worthy contribution. Concentrating on the development of the profession in America, with brief orientation in ancient veterinary history, the work leaves the complete story of veterinary medicine yet to be written.—*Kenneth B. Haas, D.V.M.*

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Dr. Asa Winter to Michigan

Appointment of Dr. Asa Winter as veterinarian in charge of the U. S. Department of Agriculture, Animal Disease Eradication Branch activities in Lansing, Michigan, effective July 29, 1956, is announced by Dr. R. J. Anderson, chief. In his new assignment Doctor Winter has supervision of state-federal cooperative disease eradication activities in Michigan.

Dr. Asa Winter

Doctor Winter formerly held the position, assistant to the chief of the Animal Disease Eradication Branch, Agricultural Research Service, in Washington, D. C., a position he had held since November 1954.

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Antivivisection agitation is at its lowest ebb in modern times.

Advances in
VETERINARY SCIENCE

Edited by C. A. BRANDLY, University of Wisconsin
and E. L. JUNGHERR, University of Connecticut

Volume III

April 1957, about 425 pp., illus., approx. $10.00

CONTENTS:

AXEL THOMSEN, The Eradication of Bovine Brucellosis in Scandinavia
GERALD RENOUX, Brucellosis in Goats and Sheep
H. S. CAMERON, Swine Brucellosis
M. VANDEPLASSCHE, Artificial Insemination of Cattle with Special Reference to Fertility and Disease Control
J. R. M. INNES and L. Z. SAUNDERS, Diseases of the Central Nervous System of Domesticated Animals and Comparisons with Human Neuropathology
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L. W. HALL, Anaesthesiology
L. MEYER JONES, Anti-Nematodal Drugs
HUGH MCL. GORDON, Helminthic Diseases
AUTHOR INDEX — SUBJECT INDEX.

Previously published:

Volume I, 1953, 431 pp., illus., $9.00

Review:

"This book serves as Volume I of a series that plans to review progress in the more active fields of research pertinent to veterinary science and application of the knowledge to the art of veterinary medicine and veterinary public health. Extensive references and an efficient index comprise features that enhance the highly informative and readable subject matter."

—Veterinary Medicine

Volume II, 1955, 449 pp., illus., $10.00

Review:

"This volume of 449 pages and 1,458 references reflects the trend of the rapidly increasing knowledge in veterinary sciences that is a part of the overall rapid advances in the medical sciences. It should be required reading for research workers and teachers in veterinary medicine and a valuable source of the most recent information, summarized by experts, for the use of students and practitioners."

—Science

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PRACTICE FOR SALE: North Texas Rich Dairy-Industrial Center. Modern small animal clinic and home. Only practitioner in county. Gross $25,000. Sale price $26,500. $7,000 down, 15 years balance. Inquire only if seriously interested. Address Box 343, care VETERINARY MEDICINE.

ANY DOG BOOK: General titles by Will Judy—Principles of Dog Breeding $4. Ken'l Bldg. & Plans $3. Training the Dog $3. Dog Scrapbook $3. Dog Care & Keeping $2. Judy Publ'g Co., (Dog World), 3323 Michigan Blvd., Chicago 16.

WANTED: Veterinarian with field experience for position as diagnostician and consultant. Indiana license or reciprocity necessary. Substantial salary and other benefits. Applicant should submit brief information on background, references and general qualifications in writing for interview appointment. Anchor Serum Co. of Indiana, Inc., P.O. Box 1177, Indianapolis 6, Ind.

FOR SALE: Large animal practice in N.E. Nebraska. New ranch home, office, double garage, drugs, equipment. Average yearly gross, $46,000. Price $30,000., $15,000. down. Terms on balance. Reason for selling: Other interests. Inquire only if seriously interested. Address Box 345, care VETERINARY MEDICINE.

VETERINARIAN WANTED: Extensive general practice in Illinois. Can lead to profit sharing basis. State availability, experience, and other key information. Address Box 346, care VETERINARY MEDICINE.

Spaying pregnant heifers can not be depended upon to abort such females. Stilbestrol (100 mg. parenterally) is recommended in these cases.—*Frank Jordan, D.V.M.*

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Intensive study of the hypothalamus has followed the suggestion of some endocrinologist of the role of this region of the diencephalon in endocrine balance.

Abortion due to Fungi

In reporting a case of mycotic abortion in a cow, Moreira-Jacob and van Uden[1] isolated *Aspergillus niger* and considered it to be responsible.

Ubiquitous and essentially saprophytic *A. niger* and quite a number of other fungi have been from time to time incriminated as responsible for genital disorders. Incidence of mycotic abortion may be greater than so far credited because of difficulties of laboratory diagnosis and infrequent reports of confirmed cases.

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There are some 1,200 full-time public health organizations in the United States that could use the services of a qualified public health veterinarian on their staffs.

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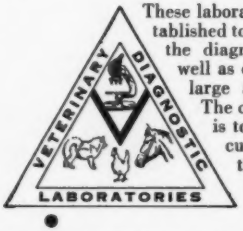
In areas where extensive irrigation is practiced, leptospirosis presents a most serious problem of control. Infection is known to spread in slow moving streams.

[1]M. Moreira-Jacob, and N. van Uden, Mycotic Abortion in Cattle. Brit. Vet. Jour. 112:453 (Oct.), 1956.

Laboratory Service for Veterinarians



These laboratories have been established to aid veterinarians in the diagnosis of obscure as well as common ailments in large and small animals. The chief aim of our staff is to give quick and accurate diagnosis at all times.

Our service includes fecal examinations, anti-biotic sensitivity tests, urinalyses, blood counts, tissue sections, bacteriological cultures, cultures for ringworm and blood chemistry. It is designed to assist owners and breeders of stock of all kinds including dogs, cats, horses, cattle, poultry, hogs and sheep.

Sample containers and price list on request.

VETERINARY DIAGNOSTIC LABORATORIES

3 East 65th St., New York 21, N.Y.

Cancer Destroyed by Virus

In a special information released to *Medical News* (Nov. 19, 1956) Dr. Wallace P. Rowe and Dr. Robert J. Huebner of the National Institutes of Health, Bethesda, Md., report successful results following use of "trained" viruses to attack and destroy human cancers grown in rats.

Viruses grown in tissue culture are passed repeatedly through rat Hela tumors. Several became "highly ancolytic" after 12 to 16 passages. These "adapted viruses" are then injected intravenously to rats in which have been developed "relatively uniform" carcinomatous explants in the abdomen of experimental animals.

Investigators report that within three to six days "the large solid tumors seemed to disappear," while untreated tumors in control rats continued to grow "luxuriantly."

Work to date only suggest possible application for future clinical studies.

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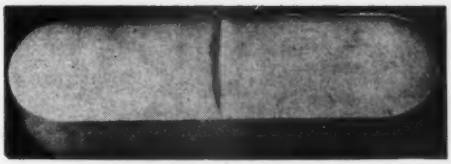
Incidence of poliomyelitis for the disease year 1956 is about 50% of that reported for the comparable period in 1955.



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Adsorbents, coagulants and detoxicants for the symptomatic treatment of diarrheas in larger calves and adult cattle.

Field reports attest its value in "winter scours" and coccidial diarrhea.

Administer 1 **AKRATAN "Jumbolus"** to each 350 pounds body weight (3 per 1000 lbs.).

May be repeated at 12 to 24 hour intervals, as necessary. Fits usual "equine" balling gun.

Tannin extract 100 gr, Alumina hydrate 100 gr, Akrodin® 60 gr, Magnesium trisilicate 30 gr, Charcoal 30 gr, Magnesium carbonate 30 gr, Bentonite 20 gr.

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Actual size of standard model.

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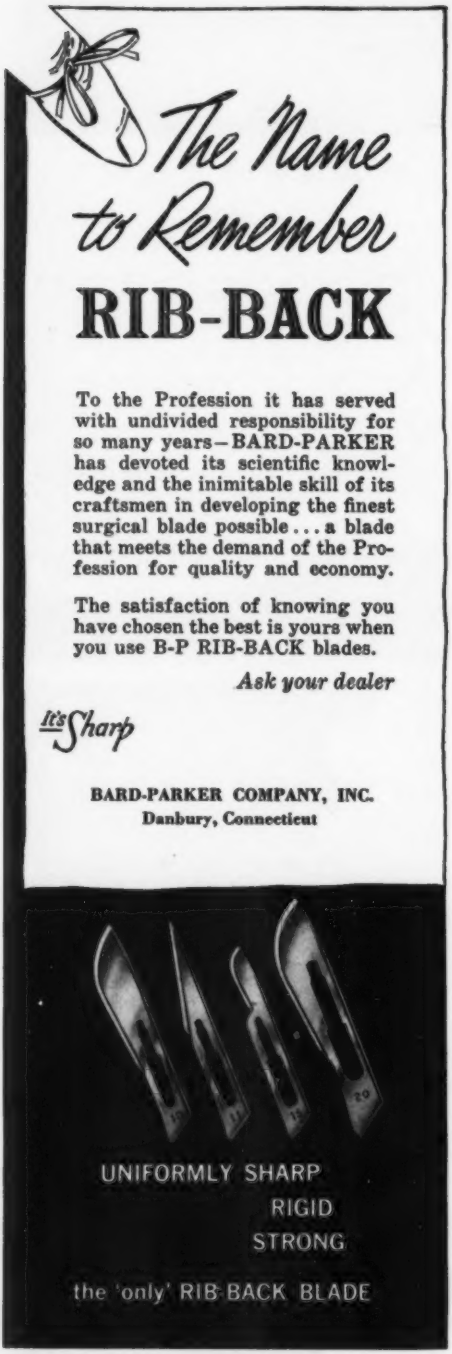
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the 'only' RIB-BACK BLADE

Doctor Gooding to California

Appointment of Dr. C. L. Gooding as veterinarian in charge of the U. S. Department of Agriculture's Animal Disease Eradication Branch and Animal Inspection and Quarantine Branch activities in Sacramento, California effective October 7, 1956 is announced by Dr. C. D. Van Houweling, director of Livestock Regulatory Programs for the Department's Agricultural Research Service. In his new assignment Doctor Gooding will be responsible for the administration of programs relating to the control and eradication of tuberculosis and brucellosis of cattle, scabies in sheep and cattle, bluetongue in sheep, and other major livestock diseases. He will also give general supervision over all Animal Inspection and Quarantine Branch activities in California.

Doctor Gooding has been chief of the Animal Inspection and Quarantine Branch in Washington, D. C. since reorganization of the Department of Agriculture in January 1954.

▼ ▼ ▼

Paratyphoid (Salmonellosis) in Swine

British veterinarians report "spectacular recovery" with healing of skin lesions, improved appetite, and recovery from diarrhea following an outbreak of salmonellosis in a drove of swine[7]. Furacin (nitrofurozone—Eaton) was mixed with dry meal feed to yield a concentration of 0.05% furacin. Equally encouraging results were obtained in over 30 other herds except for relapses in two cases which occurred probably because of epizootic conditions resulting in reinfection from contaminated feces.

[7]Felgate, C. A., and Swann, H. C., The Use of Nitrofurozone in the Treatment of Swine in the Field. *Vet. Rec.*, 68:259 (May 5), 1956.

Have you considered the advantages of ***Aeroderm***® *plastic spray-on bandage in the following?*

After bovine laparotomy...

Sprayed directly over sutures, Aeroderm forms a tough, flexible, transparent, plastic film barrier which protects against infection, abrasion and injury from body discharges. Cleanly healing incision fosters uneventful recovery.

In severe excoriation...

The tough Aeroderm film protects the excoriated area from further damage and fosters healing, e.g., urine burns of thighs in obese bitches, excoriation by serum discharge from oophorectomy wound, deep excoriation by searing discharge from infected bite wound. When excoriation is anticipated, Aeroderm dressing protects against injury.

In equine herniorrhaphy...

While tissues repair naturally, Aeroderm protects the incision from contamination by dirt and sweat and from injury by abrasion. The tough Aeroderm film is impermeable to bacteria and encourages clean wound healing.

After docking the dog's tail...

Aeroderm spray-on bandage conforms to the "difficult" shape of the stump. The protective film keeps the wound clean and avoids injury or infection from the dog's licking.

For surgical wounds in the perineal region...

Tissues can repair normally when protected against fecal contamination and urine burns by Aeroderm. This spray-on dressing adapts to body sites previously almost impossible to dress and withstands movement.

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—DEATHS OF VETERINARIANS—

Orin C. Bradley, Fairview, W. Va., NAT '92, CVC '01, died recently.

V. V. Martinson, Milwaukee, Wis., CVC '18, died recently.

Adrian J. Mitchell, Erie, Pa., CVC 809, July 23, 1956.

Charles M. Taylor, Oshkosh, Wis., Nov. 2, 1956.

E. V. Wilcox, Washington, D. C., died recently.

Frank B. Wilson, Guthrie Center, Iowa, COL '15, ed recently.

▼ ▼ ▼

Management Scholarship

Two employees of the U. S. Department of Agriculture have been announced as winners of the 1956 American Management Association Scholarship election. Dr. C. D. Van Houweling, director of Livestock Regulatory Programs, A.R.S., was one of these.

The scholarships cover a tuition of $750. for the A.M.A. Management course to be given in New York City. The course is designed for executives who wish to strengthen their performance in present responsibilities and to prepare themselves for broader authority. Intense instruction and practice in the principles, skills and tools of management is given by experienced operating executives.

▼ ▼ ▼

Three drops of a mixture of equal parts olive oil and castor oil are useful for relief of impacted crop in small caged birds. — *Alan Bachrach, D.V.M.*

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Atrophic rhinitis was reported in the United States initially only 12 years ago, yet it is now considered a major disease of swine.

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To maintain unrestricted milk flow and provide antiseptic protection is of first importance in the care of Injured teats, Scab teats, Stenosis, and in post operative therapy. Dr. Naylor Medicated Teat Dilators are SULFA-impregnated surgical dressings for the teat canal.

They act both medically and mechanically to provide prolonged broad spectrum germicidal activity and gentle non-irritating support to traumatized sphincter and teat mucosa. They promote normal tissue repair with a minimum of altered milking function of the streak canal. Positive retention — fit large or small teats.

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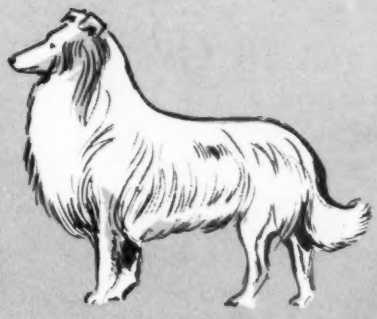

*Trade Name for Canine Distemper Vaccine and Infectious Canine Hepatitis Vaccine in Bronchisepticus-Streptococcus-Typhimurium Bacterin. (P.-M. Co., Bio. 667)

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Death of a Pioneer Veterinarian

Dr. Cornelius Cann died at Frankfort, Kentucky, on August 16, at the age of 95 years. Burial was at Lexington, Kentucky. For about 60 years, prior to his retirement four years ago, he specialized in equine practice and was widely known on the running tracks of the United States, Canada, Cuba, and Mexico. Doctor Cann was especially adept at firing horses and his services were in demand in all parts of the country.

Kentucky born Doctor Cann's interest in livestock led him to enroll in the Chicago Veterinary College, from which he was graduated in 1891. He first located at Georgetown, Kentucky, where he practiced for several years. He was fond of relating that mules were chiefly responsible for his leaving a general farm practice and taking up work on the race tracks: "A man sent for me one day, and when I showed up at his place he had 65 yearling mules to be castrated. I threw 'em all and cut 'em, at 50¢ a head." After that incident he was convinced that there was an easier way to make a living than wrestling with yearling mules, so he began to practice at race tracks.

▾ ▾ ▾

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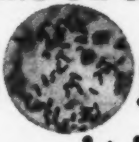

The synergistic, antimicrobial action of simultaneous therapy with penicillin and dihydrostreptomycin (such as with Combiotic) is greater than the additive effects of the individual drugs.

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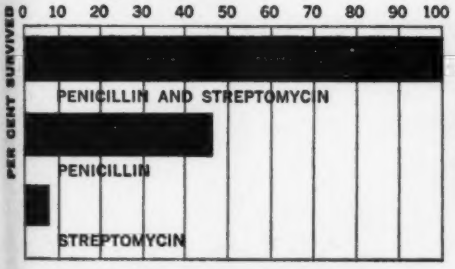
in vivo protection*



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SURVIVAL RATE OF MICE SIX DAYS AFTER INFECTION WITH KLEBSIELLA

*The synergistic effectiveness of penicillin and dihydrostreptomycin was demonstrated by in vivo studies reported by Bliss, E.A.; Warth, P.T., and Long, P.H.: Bull. Johns Hopkins Hosp. *90*:149, 1952.

Available as: **COMBIOTIC P-S (DRY)** Single-dose vials Five-dose vials
each dose contains: 100,000 units penicillin G potassium, 300,000 units penicillin G procaine, and 1.0 Gm. dihydrostreptomycin.

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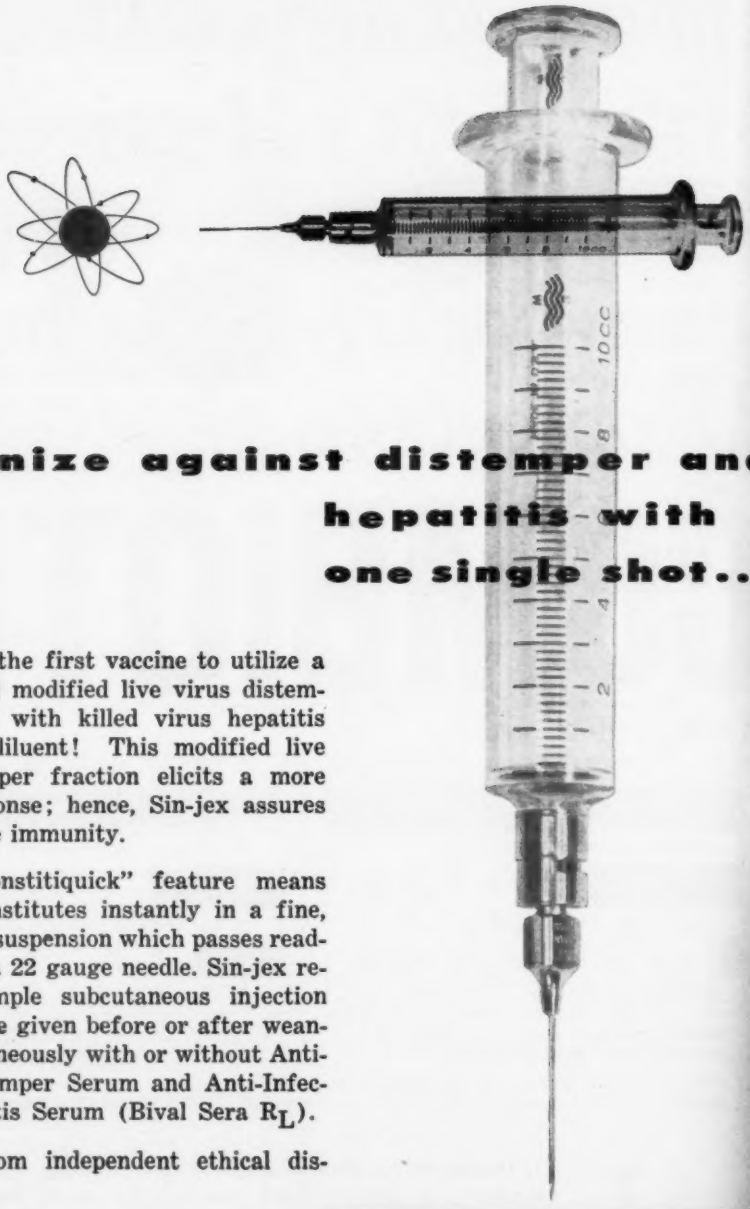

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Control of Bloat in Cattle

Livestock experts at the Mississippi Agricultural Experiment Station have studied the bloat problem intensely for several years[a]. They grazed yearling steers that bloated regularly on a pure stand of ladino clover for 90 minutes morning and afternoon. At the end of each grazing period, the steers were checked for bloat and put in dry-lot with shade and water, but no feed. Under this system, the cattle usually bloated twice a day and the experimenters had a chance to observe 3,218 cases of bloat.

Aureomycin®, terramycin®, bacitracin, streptomycin, and penicillin were given orally to the cattle at various levels ranging up to 300 mg. per treatment. It was found that a 50 mg. dose of procaine penicillin was highly effective in preventing bloat for one to three days in yearling steers. None of the other antibiotics were effective at a level (up to 300 mg.) which did not produce diarrhea. Two-year-old steers required higher levels (75 mg.) of procaine penicillin for one to three days' complete protection. The bloating was not prevented on the day of treatment but was effective the next day after treatment.

Pure potassium penicillin (in equivalent amounts) was equally as effective in preventing bloat. (Doses of 50 mg. procaine penicillin = 31.7 mg. potassium penicillin = 50,000 units of penicillin.)

---

[a]Barrentine, B. F. *Miss. Farm Res.* 19:1 (Jan.), 1956.

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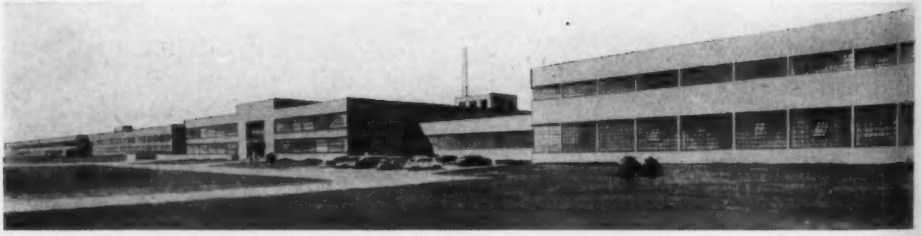

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Dosage: Average dose (for 20 to 30 lb. dog): *orally*—50 to 100 mg. two or three times daily, as indicated; *parenterally*—2 cc. (50 mg.) I.V., I.M. or subcutaneously. Occasionally, an additional 2 cc. may be required to obtain the desired clinical response. Tranquilization is obtained usually within 45 minutes following oral administration. Onset of action following parenteral administration is more rapid.

Contraindications: Hepatic diseases or disorders. Central nervous system involvement.

Packaging: 25 and 50 mg. tablets in bottles of 100 and 500; 2 cc. ampuls (25 mg./cc.) in boxes of 10 and 50.

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. . . recommend Gaines with confidence
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Gaines ***HOMOGENIZED*** **DOG MEAL**

MEETING CALENDAR

New York State Veterinary College. Forty-ninth Annual Conference for Veterinarians. Cornell University, Ithaca, N. Y., Jan. 2-4, 1957. W. A. Hagan, dean.

University of Pennsylvania. Fifty-seventh annual conference for veterinarians. College of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., Jan. 8-9, 1957. Dr. M. W. Allam, dean.

Wisconsin Veterinary Medical Association. Forty-first Annual Meeting. Schroeder Hotel, Milwaukee, Wisc., Jan. 9-11, 1957. B. A. Beach, 1215 Vilas Ave., Madison 5, Wisc., secretary.

Indiana Veterinary Medical Association. Seventy-third annual Convention. Hotel Severin, Indianapolis, Ind. January 16-18, 1957. Dr. L. M. Borst, 3315 Shelby, Indianapolis, Ind., secretary.

Michigan State University. Thirty-fourth annual Post Graduate Conference for Veterinarians. College of Veterinary Medicine, Michigan State University, East Lansing, Mich., Jan. 22-23, 1957, C. F. Clark, dean.

Iowa Veterinary Medical Association. Annual Meeting. Hotel Fort Des Moines, Des Moines, Iowa, January 22-24, 1957. F. B. Young, Walkee, Iowa, secretary.

North Carolina Veterinary Conference. Nineteenth Annual Meeting. North Carolina State College, Raleigh, N. C., Jan. 22-25, 1957. C. D. Grinnells, State College, Raleigh, N. C., chairman, Conference Committee.

Maryland State Veterinary Medical Association. Winter Meeting. Lord Baltimore Hotel, Baltimore, Md., Jan. 23-24, 1957. John D. Gadd, Cockeysville, Md., secretary-treasurer.

Virginia Veterinary Medical Association. Annual meeting. Hotel John Marshall, Richmond, Va., Jan. 27-29, 1957. W. B. Bell, 1303 Hillcrest Drive, Blacksburg, Va., secretary-treasurer.

California State Veterinary Medical Association. Midwinter Conference. School of Veterinary Medicine, University of California, Davis, January 28-30, 1957. Charles S. Travers, 3004 16th Street, San Francisco, Calif., executive secretary.

Minnesota State Veterinary Medical Society. Annual Meeting. Radisson Hotel, Minneapolis, Minn., February 4-6, 1957. B. S. Pomeroy, Minnesota School of Veterinary Medicine, St. Paul 1, Minn., secretary-treasurer.

Kansas Veterinary Medical Association. Annual Meeting. Lamer Hotel, Salina, Kans., Feb. 6-8, 1957. Dr. K. M. Curts, 70 Central Ave., Kansas City, Kans., secretary.

New Jersey Veterinary Medical Association. Annual meeting. Hotel Berkley-Cartarett, Asbury Park, N. J., Feb. 13-14, 1957. Dr. David A. Meirs, Route 9, Freehold, N. J.

Missouri Veterinary Medical Association. Convention. Chase Hotel, St. Louis, Mo., Feb. 15-16. Sales Barns Inspector's Meeting, Feb. 17. Dr. Paul L. Spencer, P.O. Box 283, Jefferson City, Mo., secretary.

(Continued on page XLVIII)

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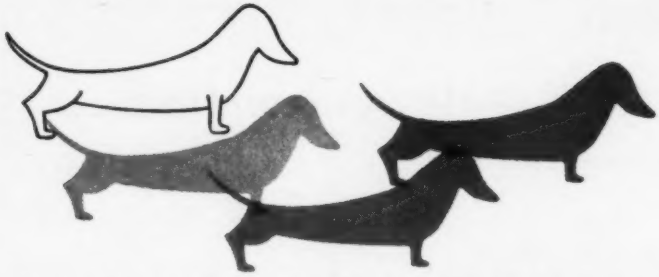

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Fox Terrier mammary tumor	1 cc. I.M., ½ hour preoperatively	"...capillary hemorrhage decreased to negligible...."
English Thoroughbred excise lachrymal duct	20 cc. I.V., at close of surgery	"...in 10 minutes bleeding had come to a practical stop...."
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*Thoroughbred Gelding** amputate scirrhous cord	bleeding despite ligatures – 10 cc. I.V., 10 cc. I.M.	"Seeping hemorrhage was arrested in 10 to 15 minutes."
Terrier panhysterectomy	Profuse bleeding during surgery – 2 cc. I.M.; 2 cc. I.V., 10 minutes later	"...marked reduction in hemorrhage within 4 minutes... hemostasis in 10 minutes."

*N.B. A second thoroughbred under identical conditions but without KOAGAMIN: postoperative seeping hemorrhage – ½ hour; oozing – an additional 2 hours.

KOAGAMIN, an aqueous solution of oxalic and malonic acids for parenteral use, is supplied in 20-cc. diaphragm-stoppered vials.

1. Rachman, M., and Frucht, T. R.: Vet. Med. *49*:341, 1954.

Chatham

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Mikedimide has a high therapeutic index, and no signs of toxicity have been observed. Animals can be put to sleep or awakened almost at will, by the alternate use of barbiturate and *Mikedimide* without any apparent harm to the animal.

We present below abstracts of a few typical case reports pertaining to the use of *Mikedimide*:

Morphine sulfate (0.5 gr.) was administered subcutaneously and 3 cc. (180 mg.) of pento barbital sodium was given intravenously to a deep surgical plane. The subject suddenly ceased breathing. The heart was weak and reflexes were absent. Two and one-half minutes after respiratory arrest, 105 mg. of *Mikedimide* was given slowly intravenously. The amplitude of respiratory movements markedly increased. Reflexes returned within one and one-half minutes. The operation and recovery were uneventful. The sleeping time was shortened about two hours.

The patient was in shock and appeared to be a poor surgical risk. A single injection (45 mg.) of pentothal sodium was administered intravenously. Respiration ceased before the injection was completed. The heart was weak and all reflexes were absent. Within 30 seconds after respiratory arrest, 1 cc. (30 mg.) of *Mikedimide* was given intravenously. Respiration was resumed within 15 seconds. The heart became strong and the palpebral reflex returned in one and one-half minutes. Recovery was uneventful.

The patient was anesthetized with surital sodium (480 mg.), given intravenously. Reflexes were absent, respiration was slightly depressed and the heart was strong. Six minutes after anesthesia, *Mikedimide* (120 mg.) was injected slowly intravenously. There was an immediate respiratory response. The palpebral reflex returned at once. At the end of the *Mikedimide* injection, the dog tried to lift his head and sniffed the operating table. Fourteen minutes after the *Mikedimide* injection, the dog was almost conscious. The sleeping time was shortened by 50 percent and recovery was uneventful.

MIKEDIMIDE *is indicated for*

1. Emergency treatment for barbiturate overdose and respiratory depression.
2. Routine antagonism therapy against barbiturate anesthesia.
3. Respiratory stimulant in the presence of barbiturates.
4. Shortening sleeping time under anesthesia.
5. Respiratory and circulatory supportitive drug in the presence of barbiturates.
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(Continued from page XLV)

Colorado A & M College. Eighteenth Annual Veterinary Conference. Colorado A & M Veterinary Hospital, Fort Collins, Colo., Feb. 18-20, 1957. Dr. O. R. Adams, Colorado A & M College, Fort Collins, Colo.

Illinois State Veterinary Medical Association. Seventy-fifth Annual Convention. LaSalle Hotel, Chicago, Ill., Feb. 25-27, 1957. C. B. Hostetler, 1385 Whitcomb Ave., Des Plaines, Ill., executive secretary.

American Animal Hospital Association. Annual Meeting. Palace Hotel, San Francisco, Calif., May 8-11, 1957. W. H. Riser, 5335 Touhy Ave., Skokie, Ill., executive secretary.

School of Veterinary Medicine, Texas A. & M. College. Tenth Annual Texas Conference for Veterinarians. College Station, Texas, June 6-7, 1957. R. D. Turk, conference chairman.

Maryland State Veterinary Medical Association. Summer Meeting. George Washington Hotel, Ocean City, Md., June 27-28. John D. Gadd, Cockeysville, Md., secretary-treasurer.

▼ ▼ ▼

Degree of excitement, rather than body weight is recommended as the primary consideration when prescribing dosage of the newer tranquilizers for canine patients.

Weighpail for Parlor Pipeline Milkers

A new stainless steel weighing device called the "Weighpail" may solve the problem of weighing and test-sampling each cow's production in modern milking parlors. By getting rid of easy-to-break and hard-to-clean glass weigh jars, the trend to parlor milking will be speeded.

The nonbreakable weighpail hangs on scales with one hose connected to the breaker cup and the other to the main milkline. Weight of the milk collected in the bucket is accurately read on scales. Then the weighpail is tipped and milk flows into the main milkline automatically.

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The weighpail, a Surge product, is built by Babson Bros. Co. of Chicago.

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It has been estimated that vesicular exanthema in swine has caused losses exceeding $6,000,000. in California alone since 1940.

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Embryonating hen's egg culture virus of foot-and-mouth disease now shows promise as an effective control agent of this disease.

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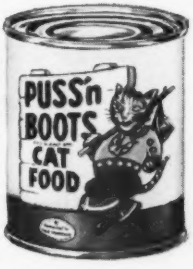

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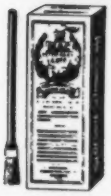

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Dr. B. R. Burmester Receives Newman Award

The Tom Newman Memorial Award Committee of the Poultry Association of Great Britain has awarded the Tom Newman Memorial Award for 1956 to Dr. Ben R. Burmester of the Regional Poultry Research Laboratory, USDA, East Lansing, Mich. The Award was granted for Doctor Burmester's research published in 1955. During that period he authored a series of seven papers on visceral lymphomatosis of chickens.

These studies demonstrated that the virus of visceral lymphomatosis can be present in normal appearing hens and is shed in their eggs. When the virus is injected into the dam a passive immunity is imparted to the chick. It was also shown that the infected, but immune, chick may be a potent source of infection to non-infected, susceptible chicks when the two are hatched or reared together.

These studies together with his work on transmitting the disease with the virus, propagation of the virus in embryonating eggs, and quantitative estimation of the virus through neutralization tests were the subject matter in the papers on which the award was presented. —*Am. Hatchery News*, 33:21 (Nov.), 1956.

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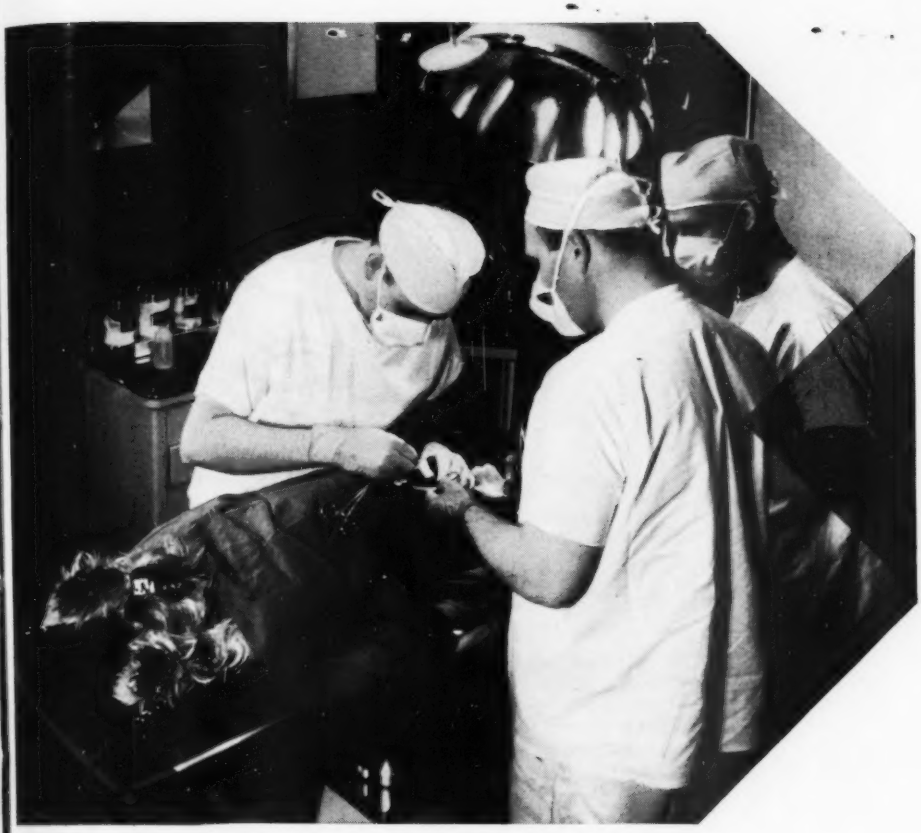

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